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ABSTRACT

Reprints of 17 studies on approaches to ensuring full participation of handicapped students in the regular classroom are presented. The studies, carried out over a 3-year period, were intended to examine evidence on the efficacy of mainstreaming, with particular emphasis on the role of competitive, cooperative, and individualistic learning experiences on friendship, interpersonal attraction, performance, achievement, and relationships between handicapped and nonhandicapped students. The studies point out the value of the cooperative learning approach in securing active participation of handicapped students, generalizing positive relationships to free time situations, promoting achievement and self-esteem of handicapped Ss, and promoting the ability of nonhandicapped students to take the perspective of their handicapped peers. The cooperative approach is said to be easily developed and implemented and to result in benefits for both handicapped and nonhandicapped students. (The studies included severely handicapped, hearing impaired, mildly retarded, and learning disabled populations.) (CL)

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FINAL REPORT

Experiments to Attain Full Participation of Handicapped Students in the Regular Classroom

Grant Number: G007902006

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SUMMARY

Experiments to Attain Full Participation of Handicapped Students in the Regular Classroom

Listed below are the studies conducted under this grant. Reprints of the articles are included. In some cases the articles have yet to be written; when they are finished they will be forwarded to your office. These studies provide important evidence concerning the conditions under which mainstreaming will be successful. Taken together, they provide the most systematic and solid evidence available on the efficacy of mainstreaming. More specifically, these studies provide evidence that:

1. Cooperative learning experiences, compared with competitive and individualistic ones, promote far more positive relationships between handicapped and nonhandicapped students. This is true for both elementary and secondary school students.
2. When placed in the same cooperative learning groups, handicapped and nonhandicapped students interact in positive and task-related ways. The handicapped students are included by their nonhandicapped peers. Handicapped students participate actively. Even though the handicapped students achieve at a significantly lower level than the nonhandicapped students, the handicapped students are involved, included, assisted, and liked.
3. The positive relationships developed during instruction generalize to free-time situations in which students can choose to interact with anyone they wish to. In such free-time situations nonhandicapped students seek out and interact positively with their handicapped peers far more after having participated in heterogeneous cooperative learning groups than when they have participated in

competitive or individualistic learning situations.

4. Even though the handicapped students achieved at a far lower level than did the nonhandicapped students, the nonhandicapped students tended to achieve higher in the cooperative condition than did their counterparts in the competitive and individualistic conditions. It may thus be concluded that including lower achieving handicapped students in the same cooperative learning groups as nonhandicapped students does not interfere with the achievement of the nonhandicapped students.
5. The self-esteem of the handicapped students tends to increase more when they work cooperatively with nonhandicapped peers than when they work competitively or individualistically in the same classroom as nonhandicapped students. It may thus be concluded that low achieving handicapped students may be integrated within cooperative learning situations in ways that increase, rather than decrease, their self-esteem. The self-esteem of the nonhandicapped students also tends to increase more in cooperative than in competitive or individualistic learning situations.
6. The nonhandicapped students who work collaboratively with handicapped peers, compared with nonhandicapped students in mainstreamed competitive and individualistic learning situations, tend to be better able to take the perspective of handicapped peers. It may thus be concluded that nonhandicapped students do benefit in terms of cognitive and social development from working collaboratively with handicapped peers.

7. These results were found with a wide variety of handicapped populations, including severely adaptively handicapped, severely hearing-impaired, educable mentally retarded, learning-disabled, emotionally-disturbed, and others.
8. These results are all the stronger due to the random assignment of students to conditions, the use of highly trained teachers who were rotated across conditions, the use of behavioral measures of interpersonal attraction, the wide variety of student populations studied, and the care taken to operationalize cooperative, competitive, and individualistic learning situations. The dependent measures included observational measures that are probably the most sophisticated yet developed for mainstreaming research.
9. The instructional strategies used in the cooperative conditions in our research are systematically developed so that any teacher can learn to use them effectively. Thus, these studies have helped validate usable classroom instructional strategies that may be used by any teacher from preschool to adult-education settings.

Simply placing handicapped students in physical proximity to their nonhandicapped peers does not ensure that constructive mainstreaming will result. Our studies indicate that it is only when cooperative learning procedures are implemented in the classroom that mainstreaming will have constructive outcomes. Both handicapped and nonhandicapped students benefit from working in heterogeneous cooperative learning groups.

RESEARCH STUDIES CONDUCTED FOR GRANT #G007902006

Experiments to Attain Full Participation of Handicapped Students in the Regular Classroom

YEAR 1

Johnson, D. W., & Johnson, R. Effects of cooperative and competitive learning experiences on interpersonal attraction between handicapped and nonhandicapped students. *Journal of Social Psychology*, 1982, *116*, 211-219.

Johnson, R., & Johnson, D. W. Building friendships between handicapped and nonhandicapped students: Effects of cooperative and individualistic instruction. *American Educational Research Journal*, 1981, *18*, 415-424.

Johnson, R., & Johnson, D. W. Effects of cooperative, competitive, and individualistic learning experiences on cross-handicap relationships and social development. *Exceptional Children*, 1982, in press.

Johnson, D. W., & Johnson, R. The integration of the handicapped into the regular classroom: Effects of cooperative and individualistic instruction. *Contemporary Educational Psychology*, 1981, *6*, 344-353.

Johnson, D. W., & Johnson, R. Effects of cooperative and individualistic instruction on the relationship and performance of handicapped and nonhandicapped students. *Journal of Social Psychology*, 1982, *117*, in press.

Smith, K., Johnson, D. W., & Johnson, R. Effects of cooperative and individualistic instruction on the achievement of handicapped, regular, and gifted students. *The Journal of Social Psychology*, 1982, *116*, 277-283.

YEAR 2

Johnson, D. W., & Johnson, R. Pulling the group's score down: Does it inevitably lead to rejection of the handicapped in a cooperative situation? *Journal of Educational Psychology*, 1982, in press.

Johnson, D. W., Johnson, R., Roy, P., & Zaidman, B. Analysis of verbal interaction in cooperative and individualistic learning situations. Submitted for publication, 1982.

Johnson, D. W., Johnson, R., & Lyons, V. A study of elaborative cognitive processing as a variable mediating achievement in cooperative learning groups. University of Minnesota, submitted for publication, 1983.

YEAR 2 (cont.)

Tjosvold, D., Johnson, D. W., & Johnson, R. Effect of partner's effort and ability on liking for partner after failure on a cooperative task. The Journal of Psychology, 1981, 109, 147-152.

Johnson, R., Johnson, D. W., DeWeerdt, N., Lyons, V., & Zaidman, B. Integrating severely adaptively handicapped seventh grade students into constructive relationships with nonhandicapped peers in science class. University of Minnesota, submitted for publication, 1982.

Johnson, D. W., & Johnson, R. The effect of effort in communicating on cooperation and interpersonal attraction: Mainstreaming hearing-impaired students. University of Minnesota, submitted for publication, 1983.

YEAR 3

Johnson, D. W., & Johnson, R. Effects of cooperative and individualistic learning experiences on interpersonal interaction and relationships between handicapped and nonhandicapped students. University of Minnesota, in preparation.

Johnson, D. W., & Johnson, R. Effects of intergroup cooperation and intergroup competition on relationships between handicapped and nonhandicapped students. University of Minnesota, in preparation.

Johnson, D. W., Johnson, R., Scott, L., & Zaidman, B. The effects of goal structure: Single-sex cooperative, mixed-sex cooperative, and individualistic on science achievement and attitudes. University of Minnesota, in preparation.

Johnson, D. W., & Johnson, R. Intergroup cooperation, intergroup competition, and individualistic learning experiences: Impact on mainstreaming. University of Minnesota, in preparation.

Tjosvold, D., Johnson, D. W., & Johnson, R. Influence strategy, perspective-taking, and relationships between high and low power individuals in cooperative and competitive contexts. University of Minnesota, submitted for publication, 1982.

SECTION I

YEAR 1

The Journal of Social Psychology, 1982, **116**, 211-219.

EFFECTS OF COOPERATIVE AND COMPETITIVE LEARNING EXPERIENCES ON INTERPERSONAL ATTRACTION BETWEEN HANDICAPPED AND NONHANDICAPPED STUDENTS*[1,2]

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SUMMARY

The effects of cooperative and competitive learning experiences on interpersonal attraction between handicapped and nonhandicapped, fourth-grade students were compared. Fifty-one students were assigned to conditions on a stratified random basis controlling for handicap, ability, and sex. They participated in two instructional units for 45 minutes a day for 15 instructional days. Cross-handicap interaction during daily free-time periods and a number of attitudes were measured. The results indicate that cooperative learning experiences, compared with competitive ones, promote more interpersonal attraction between handicapped and nonhandicapped students.

A. INTRODUCTION

The integration of handicapped students into the regular classroom (to comply with Public Law 94-142) is aimed at providing handicapped students with access to and constructive interaction with nonhandicapped peers (9). Two of the goals of mainstreaming are to build positive relationships between the handicapped and nonhandicapped and to increase their competencies in relating to each other. Yet when handicapped students are first placed in the regular classroom, nonhandicapped students seem to perceive them in negative and prejudiced ways and the close proximity seems to increase their prejudice toward their stereotyping and rejection of

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[1] This research was supported in part by the United States Department of Education, Office of Special Education, Grant No. G-79-2006.

[2] The authors wish to thank Heidi Baill, Deborah Deemer, Victor Duarte, Patricia Evans, Deborah Nelson, Steven Robinson, and Brian Zaidman for their help and assistance in conducting this study.

them (e.g., 5, 7, 12). Simply placing handicapped and nonhandicapped students in the same classroom is not sufficient to create positive relationships between them. Classroom interventions are needed that require handicapped and nonhandicapped students to interact with each other in constructive and positive ways.

A promising classroom intervention is the use of cooperative learning groups in which both handicapped and nonhandicapped students are included. Such a procedure is based on the principle that cooperative experiences promote mutual attraction among group members based on their facilitating the achievement of each other's goals (4, 8). In a *cooperatively* structured learning situation, goal attainments are positively correlated; when one student achieves his goal, all others with whom he is cooperatively linked achieve their goals. In a *competitively* structured learning situation students' goal attainments are negatively correlated; one student can achieve his goal if and only if the other students with whom he is competitively linked fail to achieve their goals. These two ways of structuring learning goals lead to different patterns of interaction among students and promote different types of student-student relationships.

There is some evidence that cooperative learning experiences, compared with "traditional," competitive, or individualistic ones, promote more positive relationships between handicapped and nonhandicapped students (2, 3, 10, 11). There are, however, a number of questions unanswered by these studies:

1. Are the positive relationships between handicapped and nonhandicapped students resulting from cooperative learning experiences strong enough so that they will seek out each other and spend time together during postinstructional free time? Martino and Johnson (11) have provided some evidence that they will do just that, but further evidence is needed that the cross-handicap relationships built in cooperative learning situations will generalize to postinstructional situations.

2. Will cooperative learning experiences promote the attitudes and competencies needed for handicapped and nonhandicapped students to interact effectively with new peers in the future? There is no previous evidence concerning this question.

3. Can behavioral evidence of interpersonal attraction be produced, as well as self-report questionnaire evidence concerning interpersonal attraction between handicapped and nonhandicapped students? Although Martino and Johnson (11), and Johnson, Rynders, Johnson, Schmidt, and

Haider (10) used behavioral measures, further behavioral evidence is needed.

The purpose of the present study is to extend and corroborate the previous research on the impact of cooperative learning experiences on cross-handicap relations with the use of a behavioral measure of interpersonal attraction in a postinstructional, free-choice situation and with the placement of handicapped and nonhandicapped students in a new situation with different peers.

B. METHODS

1. *Subjects*

*S*s were 51 students (all age 10) from three fourth-grade classes at a large elementary school in a Midwestern metropolitan area school district: 32 boys and 19 girls, of whom 10 were learning-disabled or had severe learning and behavior problems. Five of the handicapped students were black and eight of the 10 were boys. All students were assigned randomly to the two conditions stratifying for sex, ability (as determined from teacher ratings of general achievement), ethnic membership, and handicap.

2. *Independent Variable*

The independent variable consisted of two conditions: cooperative and competitive. In the cooperative condition students were instructed to work together as a group, completing one assignment sheet while ensuring that all group members had mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were assigned to five groups of four members and one group of five members on a stratified random basis, ensuring that there was one handicapped student in each group and that the groups were balanced for sex and ability. In the competitive condition students were instructed to work alone, attempting to do better work than their condition-mates, and to seek help and clarification from the teacher. Each day the students were informed where their work ranked with their condition-mates and with the teacher praising the five highest students.

3. *Procedure*

Students in each condition were together for 55 minutes a day for 15 instructional days. Each condition was assigned a separate classroom comparable in size. Two curriculum units were used, one on the use of coal as an energy source and one of the wolf as a protected species. Each day the teachers explained the day's task to the students, distributed the appropriate materials, and reviewed their goal structure. At the end of the session the completed work and all materials were collected. After the 45-minute instructional session, 10 minutes of free time was given each day, during which the students were free to move around the classroom and engage anyone they wished to in play or work. At the completion of the study, the sociometric and attitude scales were given to all students.

4. *Research Personnel*

Four teachers participated in the study. In each condition two teachers were present, one of the regular classroom teachers and a certified teacher who was hired and trained specifically to conduct the research study. The regular classroom teachers received six hours of training and the two research teachers received over 90 hours of training in the use of cooperative and competitive instructional procedures. To control for possible teacher effects, the teachers exchanged conditions halfway through the study. All teachers, therefore, spent an equal amount of time in each condition.

Four research assistants observed student cross-handicap interaction during the free-time sessions. The observers (two males and two females) were given over 10 hours of training in the use of the observation instruments. Observers attended training sessions until their interrater reliability was over 85 percent; the Harris and Lahey (6) method for combining and weighting occurrence and nonoccurrence of agreements was used.

5. *Dependent Variables*

Seven dependent variables were included in this study.

a. Free-time observations. This measure was used to determine the frequency of cross-handicap interaction during daily free-time sessions that lasted from five to 10 minutes. A measure was designed to provide an index of the proximity of a handicapped student to other students in the condition. To be classified as an interaction, the target student's peers had to be in a two-meter radius of the student, and the target student had to be in conversation or involved in the same activity with the other student. Observers were provided with a randomized list (changed daily) of the students to be observed. Observers rotated through the list as many times as possible during the free-time period. The observer agreement was 93 percent as determined by the Harris and Lahey method. To derive an index of cross-handicap interaction, the actual number of students involved in cross-handicap interaction during the free-time period was divided by the number of observations and the number of students from the other group (handicapped or nonhandicapped) in the condition.

b. Sociometric helping. This measure consisted of asking students to write down the names of students whom they had helped learn. To derive an index of cross-handicap helping, the total number of cross-handicap nominations was divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

c. Liking for each other and liking for the group product. These measures consisted of two questionnaire items given at the end of a problem-solving session. After the study had ended the students in each condition were placed in new groups of three and four members through a random procedure stratifying for sex, handicap, and teacher's ranking of their academic ability. A shortened version of the NASA decision-making task was then given. This problem required the students to rank a list of items according to their importance for survival on the moon. The students were told to reach decisions through consideration of each member's opinions, to discuss all differences, and to make all decisions by agreement of all group members without voting. Each group was then given 20 minutes to produce its solution. At the end of the 20-minute period, students were given two questionnaire items, one asking how much they liked the other members of their group and how much they liked the group's answer. The questionnaire items were Likert-type questions with a five-point response scale.

d. Cooperative, individualistic, and cohesion scales. The first two were developed by Talmage and Waxman (13), the latter by Anderson (1). All scales consisted of four items each, and the students responded "yes" or "no" to each question. The cooperation scale consisted of questions dealing with working with other students in their condition and helping each other learn. The individualistic scale consisted of questions dealing with working alone without interacting with the other students in the condition. The cohesion scale consisted of questions dealing with knowing and being friends with the other students in the condition.

6. *Analyses and Experimental Check*

The data were first analyzed by a two-way ANOVA that included the two experimental conditions and (*a*) whether the interaction was handicapped to nonhandicapped or nonhandicapped to handicapped, or (*b*) whether the questionnaire responses were from handicapped or nonhandicapped students. No significant differences were found between handicapped and nonhandicapped students and, therefore, the data were reanalyzed by *t* tests between the two experimental conditions.

Each condition was observed daily to verify that each was being taught cooperatively or competitively. The results of the observations verified that the conditions were being implemented appropriately.

C. RESULTS

The first dependent variable was the frequency of interaction between handicapped and nonhandicapped students during postinstructional free time. From Table 1 it may be seen that there were more interactions between handicapped and nonhandicapped students during that period in the cooperative than in the competitive condition, $t(18) = 1.72$, $p < .05$. On the average, handicapped and nonhandicapped students interacted 7.8 times per 10-minute session in the cooperative condition and 2.5 times per 10-minute session in the competitive condition.

The second dependent variable was the number of students involved in cross-handicap helping during the instructional sessions. From Table 1 it may be seen that there were more nominations for cross-handicap giving of help in the cooperative than in the competitive condition, $t(42) = 1.62$, $p < .10$. Those in the cooperative condition indicating that 17 students had

TABLE 1
MEAN RESPONSES FOR INTERACTION AND ATTITUDE MEASURES

Dependent variable	Cooperative	Competitive	*t* value
Free time interaction[a]	.079	.028	1.72**
Giving help[b]	.093	.052	1.62*
Off-task behavior[c]	.146	.098	.95
Liking for each other	3.950	3.460	1.66*
Liking for group product	4.140	3.500	1.70**
Cooperative scale	10.400	5.920	9.15***
Individualistic scale	6.480	10.070	6.21***
Cohesion scale	7.600	7.310	1.65*

[a] Number of cross-handicapped interactions divided by the number of intervals of observation and the number of students from the other group (handicapped or nonhandicapped) in the condition.

[b] Number of cross-handicapped nominations, divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

[c] Number of off-task behaviors divided by the number of intervals of observation.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

been involved in cross-handicapped helping, while those in the competitive condition indicated that 11 students had been involved in cross-handicapped helping.

There was no significant difference between conditions on time or task. At the conclusion of the study, the students within each condition were placed in new learning groups and given a new instructional task to be completed within one hour. The data in Table 1 indicate that the handicapped and nonhandicapped students in the cooperative condition, compared with those in the competitive condition, liked each other more, $t(43) = 1.66$, $p < .10$, and liked their group product more, $t(43) = 1.70$, $p < .05$.

Finally, the data in Table 1 indicate that students in the cooperative condition, compared with those in the competitive condition, perceived their condition to be more cooperative, $t(47) = 9.15$, $p < .01$, and less individualistic, $t(47) = 6.21$, $p < .01$ and possibly more cohesive, $t(47) = 1.65$, $p < .10$.

D. DISCUSSION

The generalizability of the results of this study is limited by the age of the students studied, the curriculum materials used, the length of the study, and the specific operationalizations of the independent and dependent variables. The results, however, indicate that cooperative learning experiences compared with competitive ones promoted (*a*) a stronger belief that they are acquainted with and are friends with their classmates (cohesion scale), (*b*) greater perceptions that handicapped and nonhandicapped students help each other learn, and (*c*) more interaction between handicapped and nonhandicapped students in postinstructional, free-time situations. And when placed in new groups and given a new instructional task, handicapped and nonhandicapped students in the cooperative condition liked each other and their group product more than those in the competitive condition. These results are significant for several reasons.

First, it has been questioned whether cooperative learning experiences will result in enough cross-handicapped liking that handicapped and nonhandicapped students will seek out each other and spend time together during free time. The results of this study indicate that in fact more such free-choice postinstructional interaction occurred after cooperative experiences than after competitive ones.

Second, the results indicate that when placed in new groups with new peers and given a new instructional task, handicapped and nonhandicapped students in the cooperative condition (compared with those in the competitive condition) liked each other and liked the product of their joint efforts more.

Deutsch (4) theorizes that it is the facilitation of each other's goals that leads to the interpersonal attraction found in cooperative situations. The results of this study provide some confirmation of that theory. Students in the cooperative condition, compared with those in the competitive condition, perceived more giving of cross-handicap help, indicated that they knew each other better and were friends and sought out each other's company during free time. There was thus a relationship between helping and liking. Cooperative learning experiences, compared with competitive ones, also promoted stronger perceptions that students could work together and help each other learn (cooperative scale) and could not work alone (individualistic scale).

The results of this study are all the stronger because of the random assignment of students to conditions, the rotation of teachers across conditions, the use of highly trained teachers to conduct the instruction, and the specific operationalizations of the cooperative and competitive conditions.

REFERENCES

1. ANDERSON, G. Assessment of Learning Environments: A Manual for "Learning Environment Inventory" and the "My Class Inventory." Halifax, Nova Scotia: Atlantic Inst. Educ., 1973.
2. BALLARD, M., CORMAN, L., GOTTLIEB, J., & KAUFMAN, M. Improving the social status of mainstreamed retarded children. *J. Educ. Psychol.*, 1977, **69**, 605-611.
3. COOPER, L., JOHNSON, D. W., JOHNSON, R., & WILDERSON, F. The effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. *J. Soc. Psychol.*, 1980, *111*, 243-252.
4. DEUTSCH, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), *Nebraska Symposium on Motivation*. Lincoln, Neb.: Univ. Nebraska Press, 1962. Pp. 275-320.
5. GOTTLIEB, J., & BUDOFF, A. Social acceptability of retarded children in nongraded schools differing in architecture. *Amer. J. Ment. Defic.*, 1973, **78**, 15-19.
6. HARRIS, F., & LAKEY, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. *Behav. Res. & Ther.*, 1978, **11**, 523-526.
7. IANO, R., AYERS, D., HELLER, H., MCGETTIGAN, J., & WALKER, V. Sociometric status of retarded children in an integrated program. *Except. Child.*, 1974, **40**, 267-271.
8. JOHNSON, D. W., & JOHNSON, R. Learning Together and Alone: Cooperation, Competition, and Individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.
9. JOHNSON, R., & JOHNSON, D. W. The social integration of handicapped students into the mainstream. In M. Reynolds (Ed.), *Social Environment of the Schools*. Reston, Va.: Council for Exceptional Children, 1980. Pp. [illegible]38.

10. JOHNSON, R., RYNDERS, J., JOHNSON, D. W., SCHMIDT, B., & HAIDER, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. *Amer. Educ. Res. J.*, 1979, **16**, 161-168.

11. MARTINO, L., & JOHNSON, D. W. Cooperative and individualistic experiences among disabled and normal children. *J. Soc. Psychol.*, 1979, **107**, 177-183.

12. PORTER R., RAMSEY, B., TREMBLAY, A., IACCOBO, M., & CRAWLEY, S. Social interactions in heterogeneous groups of retarded and normally developing children: An observational study. In B. Sackett (Ed.), *Observing Behavior: Theory and Applications in Mental Retardation*. Baltimore, Md.: University Park Press, 1978. Pp. 311-328.

13. TALMAGE, H., & WAXMAN, H. Principals as cooperative leaders. Chicago: Univ. Illinois, Chicago Circle, Office of Evaluation Research, Technical Report 131, August, 1980.

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Building Friendships Between Handicapped and Nonhandicapped Students: Effects of Cooperative and Individualistic Instruction

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The effects of cooperative and individualistic learning experiences were compared on interpersonal attraction between handicapped and nonhandicapped third-grade students. Forty students were assigned to conditions on a stratified random basis controlling for handicap, ability, sex, and peer popularity. Students participated in an instructional math unit for 25 minutes a day for 16 instructional days. Type of interaction within the instructional situation, interpersonal attraction, and frequency of interaction in a free-choice, postinstructional situation were measured. Three attitude scales were also given. The results indicate that cooperative learning experiences, compared with individualistic ones, promote more cross-handicapped interaction during instruction; promote interaction characterized by involving handicapped students in the learning activities, giving them assistance, and encouraging them to achieve; promote more cross-handicap friendships; and promote more cross-handicap interaction during postinstructional free-time.

The integration of handicapped students into the regular classroom is based on the assumption that contact between handicapped and nonhandicapped students will result in constructive cross-handicapped relationships. There are many reservations, however, about the efficacy of mainstreaming among educators and psychologists. There are questions about whether the

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mainstreamed students will be ignored and shunned by their nonhandicapped peers, whether the handicapped students will disrupt the work of nonhandicapped students, and whether the nonhandicapped students will reject and dislike the mainstreamed students. Many of these reservations are based on evidence that when handicapped students are placed in the regular classroom, they tend to be perceived by their nonhandicapped peers in negative and prejudiced ways and not related to constructively (e.g., Gottlieb & Budoff, 1973; Iano et al., 1974; Porter et al., 1978). There seems to be a need for classroom interventions that require handicapped and nonhandicapped students to interact with each other in constructive and positive ways.

On the basis of the theoretical and empirical work by Deutsch (1962) and Johnson and Johnson (1975), it may be argued that the way in which instructional goals are structured controls the nature of student-student interaction, and that different student-student interaction patterns will lead to different outcomes for mainstreaming. Two of the ways in which instructional goals may be structured are cooperatively and individualistically. In a *cooperatively* structured learning situation students' goal attainments are positively correlated; when one student achieves his or her goal, all others with whom he or she is cooperatively linked achieve their goals. In an *individually* structured learning situation students' goal attainments are independent; when one student achieves his or her goal, the goal attainment of other students is unaffected.

Despite the preliminary evidence that cooperative learning experiences promote more positive relationships between handicapped and nonhandicapped students than do "traditional," competitive, and individualistic learning experiences (Ballard et al., 1977; Cooper et al., 1980; Johnson et al., 1979; Martino & Johnson, 1979), there is a need for further empirical work to clarify a number of issues. There is almost no evidence concerning the nature and frequency of interaction between handicapped and nonhandicapped students in cooperative and individualistic situations. The frequency, quality, affective tone, and task relevance of the interaction need to be determined. The degree to which friendships result from the cross-handicap interaction and whether the friendships extend into post-instructional situations need to be determined.

The purpose of this study, therefore, is to extend and corroborate the previous research by focusing on (a) the frequency and quality of cross-handicap interaction, (b) the relationships formed between handicapped and nonhandicapped students, and (c) the generalizability to free-time situations of instructional cross-handicap relationships.

METHOD

The subjects were 40 third-grade students from three different classrooms in a midwestern suburban school district. The sample consisted of 21 males and 19 females, of whom eight (five males and three females) were identified as having severe learning and behavior problems. These students were referred to special education services for reading, mathematics and behavior problems. They were 2 years or more academically behind their classmates and/or were markedly disruptive. All eight students were rejected by their classmates (as measured by a sociometric roster-rating questionnaire). All students were randomly assigned to conditions, stratifying for sex, ability (as determined by teacher ratings of general achievement), handicap, and peer status (as measured by a sociometric roster-rating questionnaire). Four handicapped students were assigned to each condition. Twelve males and eight females were assigned to the individualistic condition, and nine males and 11 females were assigned to the cooperative condition. There were an equal number of high-, medium-, and low-ability students in each condition, and there were an equal number of well-liked, medium-liked, and low-liked students assigned to each condition.

Independent Variable

The independent variable consisted of a cooperative and an individualistic condition. In the *cooperative* condition students were instructed to work together as a group, completing one assignment sheet while ensuring that all group members mastered the assigned material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in five groups of four members. Four groups had one handicapped student as a member. The groups were balanced for sex, ability, and peer status. In the *individualistic* condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually.

Procedure

Students in each condition were together for 25 minutes a day for 16 instructional days. The study was conducted during the last 4 weeks of the school year. Each condition was assigned a separate classroom comparable in size. The content of the mathematics curriculum was identical for the two conditions. Each day the teachers would explain the day's mathematics assignment to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. At the completion of the study the students responded to the experimental questionnaire.

Research Personnel

Two teachers participated in the study. One teacher was the students' regular teacher and one teacher was a certified teacher hired to help conduct the study. Both teachers had received over 60 hours of training in how to implement the two experimental conditions. At the midpoint of the study the two teachers switched conditions, so that both spent an equal amount of instructional time in each condition. The teachers were originally randomly assigned to conditions.

Four research assistants observed on a daily basis in both conditions. The observers (two males and two females) were given over 10 hours of training in the use of the observation instruments. Observers attended training sessions until their interrater reliability was over 85 percent (using the Harris & Lahey [1978] method for combining and weighting occurrence and nonoccurrence of agreement).

Dependent Variables

The dependent variables were: off-task behavior, interaction of handicapped and nonhandicapped students during instruction, cross-handicap interaction during free time, a sociometric measure of cross-handicap liking, and three attitude scales. The *off-task* and *observation of cross-handicap interaction during instruction* measures were used in the following way. The observers first recorded whether a target student's behavior was off-task. If the behavior was on-task, the nature of the behavior and the target of the verbal behavior was recorded. On-task behavior was divided into the following categories: questions, leads (directives and suggestions), help and assistance, encourages-praises-agrees, negative statements, and all other comments. In each condition, two observers used a sequential time-sampling method of observation. Each student was observed for 10 seconds. A 5-second interval was then taken to record the behavior. In the cooperative condition the groups were observed in a predetermined, random order that was changed daily; all members of one learning group were observed and then the observers would move on to the next group. In the individualistic condition, students were observed in a predetermined, random order that was changed daily. The observer agreement was 88 percent during the study (using the Harris & Lahey method). To derive an index of cross-handicap interaction, the actual number of verbal comments by nonhandicapped students directed toward their handicapped peers was divided by the number of intervals of observation and the number of nonhandicapped students in the condition.

The *free-time cross-handicap interaction* measure was used to determine the frequency of cross-handicap interaction during the two 30-minute free-time sessions given at the end of the study. A measure was designed to provide an index of the proximity of a handicapped student to other students in the condition. To be classified as an interaction, the handicapped student's nonhandicapped peers had to be in a two-meter radius of the handicapped student and the handicapped student had to be in conversation or involved in the same activity with the nonhandicapped students. Observers were provided with a randomized list (changed daily) of the students to be observed. Observers were rotated through the list as many times as possible during the free time period. The observer agreement was 93 percent during the study (using the Harris & Lahey method). To derive an index of cross-handicap interaction, the actual number of students involved in cross-handicap interaction was divided by the number of observations and the number of students from the other group (handicapped or nonhandicapped) in the condition. In addition, the frequency with which the handicapped students were alone and isolated from their peers was recorded.

The *sociometric liking* measure consisted of giving each student a list of the other students in his or her condition and asking the student to circle the names of the three students who were his or her best friends. To derive an index of cross-handicap liking, the number of cross-handicap nominations was divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

Finally, three attitude scales were given to all students. A *cooperation* scale consisted of questions dealing with working with other students and helping them learn. An *individualistic* scale consisted of questions dealing with working alone without interacting with other students. Both of these scales were developed by Talmage and Waxman (1980). Each had four items, and students answered "yes" or "no" to each item. A two-item, *peer support and encouragement for learning* scale developed by the authors was given; students responded on a 5-point scale as to whether other students liked to help them learn and cared about how much they learned.

Analyses

The data were first analyzed by a MANOVA that included the two experimental conditions and whether the interaction was handicapped to nonhandicapped or vice versa or whether the questionnaire responses were from handicapped or nonhandicapped students. No significant differences were indicated between handicapped and nonhandicapped students. Significant differences were indicated between the two experimental conditions. The data were then reanalyzed by *t* tests between the two experimental conditions.

Experimental Checks

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

RESULTS

The first dependent variable was the interaction between handicapped and nonhandicapped students during instruction. From Table 1 it can be seen that in the cooperative condition, compared with the individualistic one, nonhandicapped students asked their handicapped peers more questions, $t(6) = 2.21$, $p < .05$, addressed more directions and suggestions to them, $t(6) = 2.26$, $p < .05$, provided more help and assistance to them, $t(6) = 2.19$, $p < .05$, tended to encourage and praise them more, $t(6) = 1.54$, $p < .10$, tended to make more negative comments to them, $t(6) = 1.73$, $p < .10$, and generally talked more to them, $t(6) = 3.53$, $p < .01$. On the average, there were eight verbal comments directed to the handicapped students by their nonhandicapped peers in the cooperative condition and only two such comments in the individualistic condition.

The second dependent variable was the amount of off-task behavior. From Table I it can be seen that there was no significant difference between the two conditions on this variable.

The third dependent variable was the interaction between handicapped and nonhandicapped students during postinstructional, free-time sessions. From Table I it can be seen that there were more cross-handicap interactions in the cooperative than in the individualistic condition, $t(14) = 4.93$, $p < .01$. On the average, there were 48 interactions per session between handicapped and nonhandicapped students in the cooperative condition and only 16 such interactions in the individualistic condition. Handicapped students were more frequently alone in the individualistic condition than in the cooperative condition, $t(14) = 2.84$, $p < .01$.

The fourth dependent variable was the sociometric nomination of friends. From Table I it can be seen that there tended to be more cross-handicap nominations of friends in the cooperative than in the individualistic condition, $t(37) = 1.56$, $p < .10$.

Finally, the data in Table I indicate that students in the cooperative condition, compared with those in the individualistic condition, perceived more peer support and encouragement for learning, $t(37) = 2.75$, $p < .01$, more cooperation among students, $t(38) = 5.76$, $p < .01$, and less working alone without interacting with other students, $t(38) = 8.38$, $p < .01$.

DISCUSSION

The first conclusion that can be made from the results of this study is that there was far more interaction between handicapped and nonhandicapped students in the cooperative than in the individualistic condition. Nonhandicapped students addressed four times as many comments to their handicapped peers in the cooperative than in the individualistic condition. The second conclusion is that 94 percent of the comments were positive or neutral in their affective tone. The third conclusion is that the emphasis in the cooperative groups was on including the handicapped students in the groups' work and providing them with assistance and encouragement for contributing to the groups' efforts. Twenty percent of the nonhandicapped students'

TABLE I

Mean Responses for Interaction and Attitude Measures

Dependent Variables	Cooperative	Individualistic	t-Value
Questions[a]	.046	0	2.21**
Leads: Directives, Suggestions[a]	.047	.011	2.26**
Help and Assistance[a]	.051	0	2.19**
Encourages, Praises, Agrees[a]	.020	0	1.54*
Negative Statements[a]	.013	0	1.73*
All Other Statements[a]	.047	.042	.24
Total Instructional Talks[a]	.224	.054	3.53***
Off-task Behavior[b]	.094	.096	n.s.
Free-time Interaction[c]	.088	.023	4.93***
Free Time: Alone[c]	0	.173	2.84***
Sociometric Nominations[d]	.169	.101	1.56*
Peer Academic Support Scale	7.000	5.420	2.75***
Cooperation Scale	11.700	8.300	5.76***
Individualistic Scale	6.200	10.800	8.38***

[a] Number of instances of verbal behavior being directed towards a handicapped student by a nonhandicapped peer divided by the number of observation intervals and the number of nonhandicapped students in the condition.

[b] Number of off-task behaviors divided by the number of intervals of observation.

[c] Number of interactions between handicapped and nonhandicapped students divided by the number of intervals of observation and the number of students from the other group (handicapped or nonhandicapped) in the condition.

[d] Number of cross-handicap nominations divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

* $p < .10$

** $p < .05$

*** $p < .01$

statements to their handicapped peers were questions, 21 percent were directives and suggestions, 23 percent were comments aimed at helping and assisting the handicapped peers, 9 percent were encouraging and praising comments, 6 percent were hostile or rejecting in tone, and 21 percent were other comments (most of which were given factual information). Fears that handicapped students will be ignored or rejected within the cooperative learning groups seem unfounded. Nonhandicapped students seem to interact with their handicapped peers in positive and task-oriented ways. And it seems to be the experience of working together to achieve mutual goals that promotes the positive relationships between handicapped and nonhandicapped students.

Deutsch's (1962) original theory implied that group members who behaved in ways that interfered with the group's success would be disliked. The handicapped students in this study had severe learning disabilities and severe emotional-behavioral problems. Yet their learning and behavioral problems did not result in their being rejected or ignored by their nonhandicapped peers. Johnson and Johnson (1972) argued that it is the expectation that one's fellow group members will attempt to facilitate the achievement of the group's goal that promotes liking, not the actual facilitation of achievement. The results of this study indicate that students in the cooperative condition did have stronger perceptions that they were working together and trying to help each other learn (cooperation scale), were spending less time working alone (individualistic scale), and were encouraging each other to master the assigned material (peer academic support scale). And there was more cross-handicap liking in the cooperative than in the individualistic condition. These results tend to support the Johnson and Johnson modification of Deutsch's theory.

There is almost no previous evidence that the liking handicapped and nonhandicapped students develop in cooperative activities generalize to new, unstructured situations in which students are free to choose who they wish to interact with. The results of this study indicate that the relationships handicapped and nonhandicapped students developed during their collaborative activities do generalize to postinstructional, free-time situations. The results also indicate that the handicapped students in the individualistic condition tended to stay isolated during the free-time periods.

The lack of significant differences between the two conditions on the amount of off-task behavior indicates that placing behavioral-problem students in cooperative groups does not result in increased acting out or the disruption of the academic work of the nonhandicapped students.

The results of this study have important practical implications for educational practice. In most classrooms, mainstreaming is being conducted in a highly individualistic way so that handicapped students work on their own, on simpler materials than their classmates, and with a minimum of interaction with their nonhandicapped peers (Johnson & Johnson, 1980). The findings of this study indicate that cooperative learning experiences will promote more interaction between handicapped and nonhandicapped students, that the interaction will be characterized by task involvement, helping, and encouragement, that more cross-handicapped friendships will develop, and that the cross-handicapped relationships will be more likely to generalize to postinstructional, free-choice situations. When handicapped students are mainstreamed into the regular classroom, it seems advisable to use cooperative learning procedures.

REFERENCES

BALLARD, M. ET AL. Improving the social status of mainstreamed retarded children. *Journal of Educational Psychology*, 1977, *69*, 605–611.

COOPER, L. ET AL. Effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. *Journal of Social Psychology*, 1980, *111*, 243–252.

DEUTSCH, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln, Neb.: University of Nebraska Press, 1962.

GOTTLIEB, J., & BUDOFF, A. Social acceptability of retarded children in nongraded schools differing in architecture. *American Journal of Mental Deficiency*, 1973, *78*, 15–19.

HARRIS, F., & LAHEY, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. *Behavior Research and Theory*, 1978, *11*, 523–526.

IANO, R. ET AL. Sociometric status of retarded children in an integrated program. *Exceptional Children*, 1974, *40*, 267–271.

JOHNSON, D. W., & JOHNSON, R. *Learning together and alone: Cooperation, competition, and individualization*. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

JOHNSON, D. W., & JOHNSON, S. Effects of attitude similarity, expectation of goal facilitation, and actual goal facilitation on interpersonal attraction. *Journal of Experimental Social Psychology*, 1972, *8*, 197–206.

JOHNSON, R., & JOHNSON, D. W. The social integration of handicapped students into the mainstream. In M. Reynolds (Ed.), *Social environment of the schools*. Reston, Vir.: Council for Exceptional Children, 1980.

JOHNSON, R. ET AL. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. *American Educational Research Journal*, 1979, *16*, 161–168.

MARTINO, L., & JOHNSON, D. W. Effects of cooperative versus individualistic instruction on interaction between normal-progress and learning-disabled students. *Journal of Social Psychology*, 1979, *107*, 177–183.

PORTER, R. ET AL. Social interactions in heterogeneous groups of retarded and normally developing children: An observational study. In B. Sackett (Ed.), *Observing behavior: Theory and applications in mental retardation*. Baltimore, Md.: University Park Press, 1978, 311–328.

TALMAGE, H., & WAXMAN, H. Principals as cooperative leaders. Office of Evaluation Research, Technical Report 131. Chicago: University of Illinois, Chicago Circle, August 1980.

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Effects of Cooperative, Competitive, and Individualistic Learning Experiences on Cross-Handicap Relationships and Social Development

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Running Head: Cross-Handicap Relationships

Abstract

The effects of cooperative, competitive, and individualistic learning experiences were compared on relationships between handicapped and nonhandicapped students and their self-esteem and perspective-taking ability. Fifty-nine students were assigned to conditions on a stratified random basis controlling for handicap, ability, and sex. Students participated in two instructional units for 60 minutes a day for 15 instructional days. Behavioral measures were taken for cross-handicap interaction during instruction and during daily free-time periods. The results indicate that cooperative learning experiences, compared with competitive and individualistic ones, promote more interpersonal attraction between handicapped and nonhandicapped students and promote higher self-esteem on the part of all students. Cooperation promoted greater perspective-taking ability than did competition.

Effects of Cooperative, Competitive, and Individualistic Learning Experiences on Cross-Handicap Relationships and Social Development

Mainstreaming is based on the assumption that when handicapped students are placed in the regular classroom constructive relationships will form between handicapped and nonhandicapped students. Many educators and psychologists, however, have reservations about the efficacy of mainstreaming. There are questions concerning whether the handicapped students will be ignored and rejected, whether they will be interacted with only when it is required by the teacher, whether their self-esteem will suffer, and whether the nonhandicapped students will benefit in any way from mainstreaming. The current evidence is not encouraging. A number of studies have found that when handicapped students are placed in the regular classroom they tend to be perceived by their nonhandicapped peers in negative and prejudiced ways (e.g., Gottlieb & Budoff, 1973; Iano, et. al., 1974; Porter, et. al., 1978). Simply placing handicapped students in the regular classroom does not seem to be enough to build positive relationships between handicapped and nonhandicapped peers. Classroom interventions are needed that require handicapped and nonhandicapped students to interact with each other in constructive and positive ways.

It may be argued that the way in which instructional goals are structured controls the nature of student-student interaction, and that different student-student interaction patterns will lead to different outcomes for mainstreaming (Deutsch, 1949; Johnson & Johnson, 1975). There are three ways in which instructional goals may be structured: cooperatively, competitively, and individualistically. In a cooperatively structured learning situations students' goal attainments are positively correlated; when one student achieves his or her goal, all others with whom he or she is cooperatively linked achieve their goals. In a competitively structured learning situation students' goal attainments are negatively correlated; one student can achieve his or her goal if and only if the other students with whom he or she is competitively linked fail to achieve their goals. In an individualistically structured learning situation students' goal attainments are unrelated and independent; when one student achieves his or her goal, the goal attainment of other students is unaffected.

There is some evidence that cooperative learning experiences promote more positive relationships between handicapped and nonhandicapped students than do "traditional," competitive, or individualistic learning experiences (Ballard, et. al., 1977; Cooper, et. al., 1980; Johnson, et. al., 1979; Martino & Johnson, 1979). Despite this research, however, there are theoretical and practical issues that need to be clarified by further empirical work. These issues focus on the frequency of interaction between handicapped and nonhandicapped students during instructional activities, the generalization of cross-handicap relationships to free-time situations, the impact of the learning experiences on self-esteem, and the impact of the learning experiences on the ability of nonhandicapped students to take the social perspective of their handicapped peers.

Despite the theorizing that it is the student-student interaction promoted by the cooperative goal structure that leads to more positive relationships between handicapped and nonhandicapped students, there is almost no evidence as to the frequency and nature of the interaction taking place between the two groups of students in cooperative, competitive, and individualistic situations. Placing handicapped students in cooperative learning groups does not mean that they will be included in the groups' work and interacted with by their nonhandicapped peers. The study that has examined actual interaction between handicapped and nonhandicapped students used a bowling class. There is a need to examine the actual interaction between handicapped and nonhandicapped students in an academic class.

There is a marked lack of behavioral evidence concerning the degree to which the positive cross-handicap relationships formed within cooperative groups generalize to post-instructional, free-time situations in which students are free to choose their associates. Placing handicapped students in cooperative learning groups and requiring that nonhandicapped students interact with them does not mean that nonhandicapped students will include their handicapped peers in free-time activities. Most of the evidence concerning interpersonal attraction between handicapped and nonhandicapped students, furthermore, is based on paper-and-pencil measures. To obtain a more behavioral measure of interpersonal attraction between handicapped and nonhandicapped students, and to determine the extent to which the relationships they form during instructional activities generalize to post-instructional situations, there is a need to observe the interactions between handicapped and nonhandicapped students in a free-time situation.

There is no existing evidence that nonhandicapped students benefit cognitively or socially from contact with handicapped peers. One possibility, however, is that contact with handicapped peers may increase the ability of nonhandicapped students to take the perspective of the handicapped students in their classroom. The development of perspective-taking ability is considered by many developmental psychologists as essential for growth in cognitive and more reasoning (Kohlberg, 1969; Piaget, 1950) and general social development (Johnson, 1979). If contact with handicapped students does in fact increase the perspective-taking ability of nonhandicapped students, then it may be assumed that the nonhandicapped students benefit from mainstreaming through increases in cognitive and social development.

One of the fears of many educators is that by placing handicapped students in the regular classroom their self-esteem will plummet. The greater the contact with nonhandicapped peers, the lower they believe the handicapped student's self-esteem will be. There is some evidence that cooperative learning experiences, compared with individualistic learning, promote higher self-esteem (Johnson, Johnson, & Scott, 1978). There is a need to measure the impact of the three goal structures on the self-esteem of both handicapped and nonhandicapped students.

The purpose of this study is to extend and corroborate the previous research on the impact of cooperative learning experiences, compared with competitive and individualistic ones, on the relationships between handicapped and nonhandicapped students and their social development. This study may clarify some of the questions concerning the advisability of mainstreaming and resolve some of the theoretical questions concerning the use of cooperative learning experiences to promote interpersonal attraction among heterogeneous peers by focusing on: (a) the instructional interaction between handicapped and nonhandicapped students, (b) the generalizability to free-time situations of any relationships developed between handicapped and nonhandicapped students, (c) the ability of nonhandicapped students to take the perspective of their handicapped peers, and (d) the self-esteem of handicapped and nonhandicapped students.

Method

Subjects

Subjects were 59 students from two fourth-grade classrooms at an elementary school in a midwestern metropolitan area school district. The sample consisted of 31 males and 28 females, of whom 12 were students with severe learning and behavior problems. All students were assigned randomly to conditions, stratifying for sex, ability (as determined by teacher ratings), and handicap. There were 10 males and 10 females in the cooperative condition, 11 males and 9 females in the competitive condition, and 10 males and 9 females in the individualistic condition. Each condition contained 4 handicapped students. There were a nearly equal number of high, medium, and low ability students in each condition.

Independent Variable

The independent variable consisted of three conditions: cooperative, competitive, and individualistic. In the cooperative condition students were instructed to work together as a group, completing one assignment sheet while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in five groups of four members. Four of the groups had a handicapped member. The groups were also balanced for sex and ability. In the competitive condition students were instructed to work alone, to attempt to do better work than their conditionmates, and to seek help and clarification from the teacher. Each day the students were informed where their work ranked with their conditionmates; the teacher then praised the five highest performing students.

In the individualistic condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually.

Procedure

Students in each condition were together for 60 minutes a day for 15 instructional days. The study was conducted during the fall. Each condition was assigned a separate classroom comparable in size. The content of the two curriculum units was identical for the three conditions, consisting of units on the use of coal as an energy source and on the wolf as a protected species. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review their goal structure. At the end of the session the completed work and all materials were collected. After the 50 minute instructional session, 10 minutes of free time was given each day, during which the students were free to move around the classroom and engage anyone they wished to in play or work. At the completion of the study an attitude questionnaire was given to all students.

Research Personnel

Six teachers participated in the study. In each condition two teachers were present, one of the regular classroom teachers and a certified teacher who was hired and trained specifically to conduct the research study. The regular classroom teachers received six hours of training and the three research teachers received over ninety hours of training in the use of cooperative, competitive, and individualistic instructional procedures. To control for possible teacher effects, the teachers exchanged conditions one-third and two-thirds through the study. All teachers, therefore, spent an equal amount of time in each condition.

Six research assistants observed student cross-handicap interaction on a daily basis in the three conditions. The observers (two males and four females) were given over ten hours of training in the use of the observation instruments. Observers attended training sessions until their interrater reliability was over 85 percent, using the Harris and Lahey (1978) method for combining and weighting occurrence and nonoccurrence of agreements.

Dependent Variables

The dependent variables were: cross-handicap interaction during instruction, proximity during free-time, perspective-taking ability, and five attitude scales. The instructional interaction measure was used to determine the frequency of cross-handicap interaction during instructional sessions. It consisted of observations made by two independent observers on the frequency of verbal interaction between handicapped and nonhandicapped students within each condition. A sequential time sampling method of observation employing ten second recording intervals was followed. A target child was observed for ten seconds. A five second interval was then taken to record the behavior. Behaviors were originally classified as positive (praise and complements), neutral (questions, instructions, requests, opinions, feelings, and task-related statements), and negative (name-calling, rejecting statements, negative criticism). During the study there were no negative statements and almost no positive statements. The positive statements, therefore, were combined with the neutral statements. After recording a student's behavior, the observers moved to the next target student and repeated the procedure. Each handicapped student was observed for six cycles daily. Students were observed in a predetermined random order that was changed daily. The observer agreement was 90 percent during the study (using the Harris and Lahey [1978] method). To derive an index of cross-handicap interaction, the actual number of cross-handicap interactions was divided by the number of intervals of observation and the number of students in the other group (handicapped or nonhandicapped) in the condition.

The Distance-Density Index (Zaidman, Note 1) measured the number of students within an area of constant size. The measure was designed to provide a numerical score for the social density of the immediate environment within a certain radius of the individual. A large DDI value indicates that there are many people in the proximity of the target individual. A ten-foot radius was broken up into a series of concentric zones of distance around the target student. Two numerical values were associated with each zone, one number for the area in front of the target student and another lower value for the area in back of the target student. Raw scores were converted to z-scores to correct for the different sizes of the classrooms and the different furniture arrangement in each classroom. The students were given a daily 10 minute free-time period in which they were free to associate with anyone they wished to in the classroom. The observers recorded the number of peers within a ten-foot radius of the target student. Ten students (6 nonhandicapped and 4 handicapped) were observed in each condition. A larger DDI score was assigned to students in close proximity to and facing the target student.

The perspective-taking measure was designed to measure the ability of nonhandicapped students to take the cognitive perspective of their handicapped peers. Ten nonhandicapped students were randomly selected from each condition and individually interviewed after the conclusion of the study.

In the interview each student was asked to pretend he or she had problems learning in school and tell in his or her own words about a typical school day. The story was recorded and scored on a 5-point scaled based on the increasing complexity of organization of the story. A score of "1" was given to students who [illegible] unable to take the perspective of a learning-disabled student, [illegible] of "3" was given to students who gave superficial generalizations, and a score of "5" was given for interpretative generalizations that included references to the "why" of behavior and affective reactions.

Three self-esteem attitude sacles were given. Each scale consisted of eight items. Students responded to each item on a 5-point agree-disagree scale. The General Self-Esteem scale consisted of such items as, "I am satisfied to be just what I am," "I am easy to like," and "I am a good person." All items were worded positively. The School Self-Esteem scale consisted of such items as, "I am a good student," "I am proud of my school work," and "School work is fairly easy for me." Half of the items were worded positively and half were worded negatively. The Peer Self-Esteem scale consisted of such items as, "I have many friends," "Other children think I am fun to be with," and "I am friendly towards other people." Half of the items were worked positively and half were worded negatively.

Finally a cooperative and an individualistic learning scale developed by Talmage and Waxman (1980) were given to all students. Both scales consisted of four items each, and the students responded "yes" or "no" to each question. The cooperation scale consisted of questions dealing with working with other students and helping each other learn, and the individualistic scale consisted of questions dealing with working alone without interacting with other students.

Analyses

The data were first analyzed by a two-way ANOVA that included the three experimental conditions and handicapped versus nonhandicapped students. When no significant differences were found between handicapped and nonhandicapped students, the data were reanalyzed by a one-way ANOVA among the three experimental conditions.

Experimental Checks

Each classroom was observed daily to verify that the conditions were being taught cooperatively, competitively, and individualistically. The results of the observations verified that the conditions were being implemented appropriately.

Results

The first dependent variable was the frequency of verbal comments by nonhandicapped students directed toward a handicapped peer. From Table 1 it may be seen that the handicapped students in the cooperative condition received more comments from their nonhandicapped peers than did the handicapped students in the competitive and individualistic conditions, $\underline{F}(2,43) = 8.65$, $\underline{p} < .01$. There were 49 cross-handicap interactions per hour in the cooperative condition, 17 cross-handicap interactions per hour in the competitive condition, and 6 cross-handicap interactions per hour in the individualistic condition.

The second dependent variable was the distance-density measure taken during the free-time periods. From Table 2 it may be seen that the handicapped students in the cooperative condition were closer to their nonhandicapped peers than were the handicapped students in the other two conditions, $\underline{F}(2,20)$

$= 3.22$, $p<.10$. The handicapped students in the cooperative condition had higher social densities than their nonhandicapped conditionmates, while the handicapped students in the competitive and individualistic conditions tended to have lower social densities than did their nonhandicapped peers.

The third dependent variable was the ability of the nonhandicapped students to take the social perspective of their handicapped peers. From Table 1 it may be seen that the nonhandicapped students in the cooperative condition were better able to take the social perspective of their handicapped peers than were the nonhandicapped students in the competitive condition, $t(19) = 1.47$, $p<.10$.

Finally, a number of attitude scales were administered to the students. From Table 1 it may be seen that students in the cooperative condition perceived their condition to be more cooperative, $F(2,56) = 11.50$, $p<.01$, and less individualistic, $F(2,56) = 8.62$, $p<.01$, than did the students in the competitive and individualistic conditions. From Table 2 it may be seen that students in the cooperative condition had a higher level of general self-esteem, $F(2,56) = 5.17$, $p<.01$, and school self-esteem, $F(2,56) = 2.38$, $p<.10$, than did the students in the competitive and individualistic conditions. Handicapped students had lower school self-esteem, $F(1,56) = 9.07$, $p<.01$, and lower peer self-esteem, $F(1,56) = 5.67$, $p<.05$, than did the nonhandicapped students.

Insert Tables 1 And 2 About Here

Discussion

The generalizability of the results of this study is limited by the age of the students studied, the curriculum materials used, the length of the study, and the specific operationalizations of the independent and dependent variables.

The results of this study indicate that cooperative learning experiences, compared with competitive and individualistic ones, promote more interaction between handicapped and nonhandicapped students during instruction. The interaction is characterized by stronger beliefs that students work together and help each other learn (cooperation scale) and that students do not work alone without interacting with peers (individualistic scale). The relationships built during instruction in the cooperative condition tended to continue during post-instructional free time, as handicapped and nonhandicapped students were in closer proximity during free time in the cooperative than in the other two conditions. Cooperation was also found to promote greater general and school self-esteem than did the other two conditions. Cooperation promoted greater perspective-taking ability than did competitive instruction. Finally, handicappped students were found to have lower school and peer self-esteem than did the nonhandicapped students.

One of the first concerns involving mainstreaming is whether the handicapped students will be ignored and rejected by their nonhandicapped peers. The results of this study indicate than when handicapped and nonhandicapped students are placed in cooperative learning groups together, there will be more cross-handicap interaction than will be found in competitive and individualistic learning situations. The interaction tends to be task-related with an affective tone of neutral and positive. The lack of negative remarks may reasure psychologists and educators who fear that handicapped students will be mistreated in the regular classroom.

A second concern deals with the self-esteem of the handicapped students being mainstreamed. The results of this study indicate that compared with competitive and individualistic learning experiences, cooperation promotes a general belief that one is a worthwhile person on the part of both handicapped and nonhandicapped students. Cooperative learning experiences also promote stronger beliefs that one is a competent student on the part of both handicapped and nonhandicapped students. Handicapped students were found to have lower self-esteem than their nonhandicappped peers on the school and peer dimensions.

There is no previous evidence that the nonhandicapped students gain cognitively or socially from their contact with nonhandicapped peers. The results of this study provide evidence that nonhandicapped students who work collaboratively with their handicapped peers are more accurate in taking the perspective of their handicapped conditionmates than are nonhandicapped students in the competitive condition. These results provide some indication that mainstreaming, when it involves heterogeneous cooperative learning groups, may provide important developmental experiences for nonhandicapped students.

Most of the previous research on relationships between handicapped and nonhandicapped students has used paper-and-pencil measures of interpersonal attraction and provide almost no evidence of relationships generalizing to post-instruction free-time situations. The present study provides behavior evidence that cooperative learning experiences, compared with competitive and individualistic ones, promote more interpersonal attraction between handicapped and nonhandicapped students, and that the relationships built during working collaboratively together generalize to free-time situations in which nonhandicapped students are free to choose their associates.

The results of this study are all the stronger due to the random assignment of students to conditions, the rotation of teachers across conditions, the use of highly trained teachers to conduct the instruction, and the specific operationalizations of the cooperative, competitive, and individualistic conditions within the same study. The fact that students in the cooperative condition perceived their condition to be more cooperative and less individualistic than the other two conditions further strengthens this study's results.

The results of this study have several important practical implications. The findings inicate that when cooperative learning groups are used to integrate handicapped students into regular classrooms: the handicapped students will not be ignored or leftout, but rather will be interacted with; the relationships built within the cooperative groups will be strong enough that nonhandicapped and handicapped students will interact during free-time situations; the self-esteem of both handicapped and nonhandicapped students will be promoted; and the nonhandicapped students will benefit from their interaction with handicapped peers through increased perspective-taking abilities. Current evidence indicates that in most mainstreaming situations learning activities are structured individualistically or competitively (Johnson & Johnson, 1980). Teachers would be better advised to structure learning activities cooperatively when handicapped students are being mainstreamed into the regular classroom.

References

Ballard, M., Corman, L., Gottlieb, J., & Kaufman, M. Improving the social status of mainstreamed retarded children. Journal of Educational Psychology, 1977, 69, 605-611.

Cooper, L., Johnson, D. W., Johnson, R., & Wilderson, F. Effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. Journal of Social Psychology, 1980, 111, 243-252.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), Nebraska symposium on motivation. Lincoln, Neb.: University of Nebraska Press, 1962, 275-320.

Gottlieb, J., & Budoff, A. Socail acceptability of retarded children in nongraded schools differing in architecture. American Journal of Mental Deficiency, 1973, 78, 15-19.

Harris, F., & Lahey, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. Behavior Research and Therapy, 1978, 11, 523-526.

Iano, R., Ayers, D., Heller, H., McGettigan, J., & Walker, V. Sociometric status of retarded children in an integrated program. Exceptional Children, 1974, 40, 267-271.

Johnson, D. W. Educational psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1979.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Johnson, R., & Johnson, D. W. The social integration of handicapped students into the mainstream. In M. Reynolds (Ed.), Social environment of the schools. Reston, Virginia: Council for Exceptional Children, 1980, 9-38.

Johnson, R., Rynders, J., Johnson, D. W., Schmidt, B., & Haider, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. American Educational Research Journal, 1979, 16, 161-168.

Kohlberg, L. Stage and sequence: The cognitive-developmental approach to socialization. In D. Goslin (Ed.), Handbook of socialization theory and research. Chicago: Rand-McNally, 1969, 347-480.

Martino, L., & Johnson, D. W. Effects of cooperative versus individualistic instruction on interaction between normal-progress and learning-disabled students. Journal of Social Psychology, 1979, 107, 177-183.

Piaget, J. The psychology of intelligence. New York: Harcourt, Brace, 1950..

POrter, R., Ramsey, B., Tremblay, A., Iaccobo, M., & Crawley, S. Social interactions in heterogeneous groups of retarded and normally developing children: An observational study. In B. Sackett (Ed.), Observing behavior: Theory and applications in mental retardation. Baltimore: University Park Press, 1978, 311-328.

Talmage, H., & Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle, Office of Evaluation Research, Technical Report 131, August, 1980.

Reference Notes

1. Zaidman, B. The distance-density index. University of Minnesota, Cooperative Learning Projects, Technical Report, 1980.

Table 1

Mean Responses for Interaction and Attitude Measures

	Cooperative	Competitive	Individualistic	F-Value
Instructional Interaction[a]	.022	.008	.002	8.65*
Perspective-Taking	2.500	1.700	2.000	1.03
Cooperation	9.850	7.150	7.158	11.50*
Individualistic	8.200	10.500	10.526	8.62*

*$p < .01$

[a] Number of interactions between handicapped and nonhandicapped students divided by the number of intervals of observation and the number of students from the other group (handicapped or nonhandicapped) in the condition.

Table 2

Mean Responses for Interaction and Attitude Measures

	Cooperative		Competitive		Individualistic		F-Value
	Nonh	Hand	Nonh	Hand	Nonh	Hand	
Distance-Density	-.40	.80	.36	-.54	.31	-.42	CxH: 3.22*
General Self-Esteem	4.30	4.25	3.79	3.56	3.87	4.08	C: 5.17***
School Self-Esteem	3.94	3.31	3.51	2.79	3.64	3.06	C: 2.38* H: 9.07***
Peer Self-Esteem	3.66	2.88	3.19	3.12	3.62	2.78	H: 5.67**

$^{*}p < .10$; $^{**}p < .05$; $^{***}p < .01$

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The Integration of the Handicapped into the Regular Classroom: Effects of Cooperative and Individualistic Instruction

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The effects of cooperative and individualistic learning experiences on interpersonal attraction between handicapped and nonhandicapped fourth-grade students were compared. Fifty-one students were assigned to conditions on a stratified random basis controlling for handicap, ability, and sex. Students participated in one instructional unit for 45 min a day for 16 instructional days. Behavioral measures were taken for cross-handicapped interaction within the instructional situation, during daily free-time periods, and during a postexperimental problem-solving situation with new peers. A number of attitude measures were also given. The results indicate that cooperative learning experiences, compared with individualistic ones, promote more cross-handicapped interaction during both instructional and free-time situations and more interpersonal attraction between handicapped and nonhandicapped students.

As a result of Public Law 94-142 handicapped students are being integrated into regular classrooms throughout the United States. Such "mainstreaming" is based on the assumption that through contact between handicapped and nonhandicapped students constructive relationships will be built, and the students' competencies to relate effectively with each other will be increased. Much of the current evidence, however, indicates that when handicapped students are placed in the regular classroom they are perceived by their nonhandicapped peers in negative and prejudiced ways and that interaction may even increase the stereotyping and rejection of, and prejudice toward, the handicapped students (e.g., Gottlieb & Budoff, 1973; Iano, Ayers, Heller, McGettigan, & Walker, 1974; Porter, Ramsey, Tremblay, Iaccobo, & Crawley, 1978). Simply placing handicapped students into the regular classroom does not seem to be enough to build positive relationships between them and their nonhandicapped peers. Classroom interventions are needed that require

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handicapped and nonhandicapped students to interact with each other in constructive and positive ways.

Based on the theorizing of Deutsch (1962), Johnson and Johnson (1975) and Johnson (1979) argue that the way in which instructional goals are structured controls the nature of student–student interaction, and that different student–student interaction patterns lead to different instructional outcomes. Two of the ways in which instructional goals may be structured are cooperatively or individualistically. In a *cooperatively* structured learning situation students' goal attainments are positively correlated; when one student achieves his or her goal, all others with whom he or she is cooperatively linked achieve their goals. In an *individualistically* structured learning situation students' goal attainments are independent; when one student achieves his or her goal, the goal attainment of other students is unaffected.

There is some evidence that cooperative learning experiences, compared with "traditional," competitive, and individualistic ones, promote more positive relationships between handicapped and nonhandicapped students (Ballard, Corman, Gottlieb, & Kaufman, 1977; Cooper, Johnson, Johnson, & Wilderson, 1980; Johnson, Rynders, Johnson, Schmidt, & Haider, 1979; Martino & Johnson, 1979). Despite the theorizing that it is the student–student interaction promoted by the cooperative goal structure that leads to such outcomes, there is almost no evidence as to the frequency and nature of the actual interaction taking place between handicapped and nonhandicapped students within cooperative and individualistic situations. The purpose of this study is to extend and corroborate the previous research on the impact of cooperative learning experiences on cross-handicap relations by using several behavior measures of interpersonal attraction and by examining the extent and quality of interaction between handicapped and nonhandicapped students during instruction. In addition, the generalizability of any interpersonal attraction developed between handicapped and nonhandicapped students during instruction will be examined by observing their interaction in a postinstructional, free-time situation and by placing handicapped and nonhandicapped students into a new instructional situation with new peers and observing their interaction.

METHOD

Subjects

Subjects were 51 students from two fourth-grade classes at a large inner-city elementary school in a midwestern metropolitan area school district. The sample consisted of 26 females and 25 males, of whom 12 were students with severe learning and behavior problems. These students were referred for special education services for reading, math, and behavior problems. They were 2 years or more academically behind their classmates and/or were markedly disruptive. All students were assigned randomly to the two conditions stratifying for sex, ability (as determined from teacher ratings of general achievement), and handicap. Six handicapped students (3 males and 3 females) were assigned to each condition. There were 12 females and 12 males in the cooperative condition and 14 females and 13 males in the individualistic condition. There was a nearly equal number of high, medium, and low ability students in each condition.

Independent Variable

The independent variable consisted of a cooperative and an individualistic condition. In the *cooperative* condition students were instructed to work together as a group, completing one assignment sheet while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in six groups of four students each on a stratified random basis, ensuring that there was one handicapped student in each group, and that the groups were balanced for sex and ability. In the *individualistic* condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually.

Procedure

Students in each condition were together for 55 min for 16 instructional days. Each condition was assigned a separate classroom comparable in size. The curriculum unit used for instruction was a social studies unit on the life style and culture of the Ojibwe and Dakota Indians. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. After the 45-min instructional session, 10 min of free time was given each day, during which the students were free to move around the classroom and engage anyone they wished to in play or work. At the completion of the study a questionnaire was given and half of the students in each condition (randomly selected stratifying for handicap, ability, and sex) were individually interviewed. All students participated in a postexperimental, problem-solving session.

Research Personnel

Four teachers participated in the study. In each condition two teachers were present, one of the regular classroom teachers and a certified teacher who was hired and trained specifically to conduct the research study. The regular classroom teachers received 6 hr of training and the two research teachers received over 90 hr of training in the use of cooperative and individualistic instructional procedures. To control for possible teacher effects, the teachers exchanged conditions at the midpoint of the study. All teachers, therefore, spent an equal amount of instructional time in each condition.

Four research assistants observed student cross-handicap interaction on a daily basis in both conditions. The observers (two males and two females) were given over 10 hr of training in the use of the observation instruments. Observers attended training sessions until their interrater reliability was over 85% (using the Harris and Lahey [1978] method for combining and weighting occurrence and nonoccurrence of agreement).

Dependent Variables

The dependent variables included in this study are: Observation of cross-handicap interaction during instruction, off-task behavior during instruction, free-time observation of cross-handicap interaction, participation of handicapped students in a new situation, cross-handicap giving and receiving of help during instruction, social-schema measure of cross-handicap interaction during free time and a number of attitude scales. The *cross-handicap instructional interaction* and *off-task behavior* measures were used in the following way. In each condition, two observers used a sequential time-sampling method of observation. Each student was observed for 10 sec. A 5-sec interval was then taken to record the behavior. In the cooperative condition the groups were observed in a predetermined, random order that was changed daily; all members of one learning group were observed and then the observers would move on to the next group. In the individualistic condition, students were observed in a predetermined, random order that was changed daily. The observers first recorded whether the student's behavior was off-task. If the behavior was on-task, the nature (positive or negative) and target of the verbal behavior was recorded. During the study, there was only one instance of negative interaction in both conditions and, therefore, it was dropped from the analysis. The observer agreement was 88% during the study (using the Harris & Lahey [1978] method). To derive an index of cross-handicap interaction, the actual number of cross-handicap interactions was divided by the number of intervals of observation and the number of students from the other group (handicapped or nonhandicapped) in the condition.

The *free-time observation measure* was used to determine the frequency of cross-handicap interaction during the daily free-time sessions that lasted 10 min. The measure was designed to provide an index of the proximity of a handicapped to other students in the condition. To be classified as an interaction, the handicapped student's nonhandicapped peers had to be in a 2-m radius of the handicapped student, and the handicapped student had to be in conversation or involved in the same activity with the nonhandicapped students. Observers were provided with a randomized list (changed daily) of the students to be observed. Observers rotated through the list as many times as possible during the free-time period. The observer agreement was 93% during the study (using the Harris & Lahey [1978] method). Before the free-time period began the classroom furniture was rearranged to make both classrooms identical. To derive an index of cross-handicap interaction, the actual number of students involved in cross-handicap interaction was divided by the number of observations and the number of students from the other group (handicapped or nonhandicapped) in the condition.

A *social-schema, figure-placement measure* was given to half of the students in each condition (selected on a stratified random basis balancing for handicap, sex, and ability). The interviewer placed a classroom diagram in front of the student. The student was given the names of all the other students in the condition (ordered randomly), each of which appeared on a sticker. The student was asked to imagine that it was free time in the class and instructed to place the stickers on the classroom diagram at the spots where the students would be playing in the room. They were then instructed to draw a circle around the groups of students who were engaged in an activity together. The total number of nonhandicapped students engaged in an activity with handicapped students was recorded for each student. To derive an index of cross-handicap interaction, this number was divided by the number of handicapped students in the condition.

The *participation of handicapped students measure* consisted of observing handicapped students in a new instructional taks in new cooperative learning groups. After the experiment had ended students in each condition were randomly assigned to new groups (stratifying for handicap, sex, and ability) and given a modified version of the Survival On The Moon problem to solve. The problem required the students to rank a list of items according to their importance for survival on the moon. The students were instructed to reach decisions through consideration of each member's opinions, to discuss their differences, and to make all decisions by agreement of all group members without voting. Each group was then given 20 min to produce its solution. The handicapped students were observed with the instructional-interaction measure while they worked on the problem. To derive an index of cross-handicap interaction, the percentage of intervals within which handicapped students were verbally participating was computed.

The *nomination helping measure* consisted of asking students to write down the names of the students who had helped them learn, and the names of the students they had helped learn. To derive an index of cross-handicap helping, the total number of cross-handicap nominations was divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

Several attitude scales were given to all students. A four-item *cooperation* scale consisting of questions dealing with working with other students and helping each other learn and a four-item *individualistic* scale consisting of questions dealing with working alone without interacting with other students were given. Both scales were developed by Talmage and Waxman (1980). A four-item *cohesion* scale consisting of questions dealing with knowing and being friends with the other students in the condition developed by Anderson (1973) was given. A six-item *higher-thought-processes* scale (Stelle, House, Lapen, & Kermis, 1970) consisting of questions dealing with giving rationales for answers and the application and use of what students know in new situations was given. For all of these scales students responded "yes" or "no." Finally, a two-item scale on *peer support and encouragement for learning* developed by the authors was given; students responded on a 5-point scale as to whether other students liked to help them learn and cared about how much they learned.

Analyses

The data were first analyzed by a two-way ANOVA that included the two experimental conditions and (a) whether the interaction was handicapped to nonhandicapped or vice versa, or (b) whether the questionnaire responses were from handicapped or nonhandicapped students. No significant differences were found between handicapped and nonhandicapped students and, therefore, the data were reanalyzed by t tests between the two experimental conditions.

Experimental Checks

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

RESULTS

The first dependent variable was the frequency with which handicapped and nonhandicapped students interacted during instructional sessions. From Table 1 it may be seen that there were more verbal interactions between handicapped and nonhandicapped students in the cooperative than in the individualistic condition, $t(49) = 6.18, p < .01$. There were an average of 33 interactions per hour between handicapped and nonhandicapped students in the cooperative condition and only 5 such interactions in the individualistic condition.

The second dependent variable was the frequency of off-task behavior during instructional sessions. From Table 1 it may be seen that there was more off-task behavior in the individualistic than in the cooperative condition, $t(49) = 4.27, p < .01$.

TABLE 1
MEAN RESPONSES FOR INTERACTION AND ATTITUDE MEASURES

Dependent variables	Cooperative	Individualistic	t
Instructional interaction[a]	.010	.002	6.18***
Off-task behavior	.054	.117	4.27***
Free-time interaction[b]	.011	.005	1.65*
Social schema[c]	1.260	.550	2.03*
Handicapped participation	34.100	11.500	1.34
Helping nominations[d]	.225	.000	10.32***
Cooperation scale	11.100	5.460	11.47***
Individualistic scale	6.100	11.000	11.80***
Cohesion scale	8.700	7.580	1.83*
Higher thought processes scale	14.200	12.690	1.86*
Peer academic support scale	3.530	2.810	2.30**

[a] Number of interactions between handicapped and nonhandicapped students divided by the number of intervals of observation and the number of students from the other group (handicapped or nonhandicapped) in the condition.

[b] Number of students engaging in interaction with students from the other group (handicapped or nonhandicapped) divided by the number of intervals of observation and the number of students from the other group in the condition.

[c] Number of nonhandicapped students placed with handicapped peers, divided by the number of handicapped peers in the condition.

[d] Number of students nominated as giving help or receiving help from peers from the other group (handicapped or nonhandicapped) divided by the number of students from the other group in the condition.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

The third dependent variable was the number of students involved in interaction between handicapped and nonhandicapped students during the free-time period following the instructional sessions. The data in Table 1 indicate that there were more students involved in cross-handicap interaction in the free-time sessions in the cooperative than in the individualistic condition, $t(25) = 1.65, p < .10$. On the average, handicapped and nonhandicapped students interacted five times per session in the cooperative condition and two times per session in the individualistic condition.

The fourth dependent variable was the social-schema, figure-placement task. From Table 1 it may be seen that the students in the cooperative condition placed more handicapped and nonhandicapped students together than did the students in the individualistic condition, $t(11) = 2.03, p < .05$. Students in the cooperative condition placed nine nonhandicapped students with handicapped peers, compared with three such placements in the individualistic condition.

The fifth dependent variable was the percentage of possible intervals in which handicapped students participated during the postexperimental problem-solving session. From Table 1 it may be seen that the handicapped students in the cooperative condition participated more frequently than did the handicapped students in the individualistic condition, $t(6) = 1.34, p < .15$.

The sixth dependent variable was the number of nominations concerning the giving and receiving of help. From Table 1 it may be seen that students in the cooperative condition indicated that more cross-handicap helping took place than did the students in the individualistic condition, $t(44) = 10.32, p < .01$. In the cooperative condition 39 students were named as giving help to and receiving help from peers from the other group (handicapped or nonhandicapped) in the cooperative condition, while in the individualistic condition no students were named.

Finally, the data in Table 1 indicate that students in the cooperative condition, compared with students in the individualistic condition, perceived their classroom to be more cooperative, $t(44) = 11.47, p < .01$; less individualistic, $t(44) = 11.80, p < .01$; more cohesive, $t(44) = 1.83, p < .10$; using more higher thought processes, $t(44) = 1.86, p < .10$; and having more peer encouragement for learning, $t(44) = 2.30, p < .05$.

DISCUSSION

The generalizability of the results of this study is limited by the age of the students studied, the curriculum materials used, the length of the study, and the specific operationalizations of the independent and dependent variables.

While the previous research indicates that cooperative learning experiences promote more positive relationships between handicapped and nonhandicapped students than do individualistic learning experiences, there is almost no evidence as to the frequency and nature of the actual interaction between handicapped and nonhandicapped students during instruction. The results of this study indicate that cooperative learning experiences, compared with individualistic ones, promote more frequent interaction between handicapped and nonhandicapped students during instruction. The interaction is characterized by greater perceived helping between handicapped and nonhandicapped students, and stronger beliefs that students work together and help each other (cooperation scale), that students do not work alone without interacting with other students (individualistic scale), that students know each other and are friends (cohesion scale), that students encourage and support each other's efforts to learn (peer academic support scale), and that students think through the rationale for their answers and apply and use what they know in new situations (higher-thought-processes scale). These results may quiet some of the fear that students with learning and emotional problems will be ignored and ostrasized when they are placed in heterogeneous cooperative learning groups. Not only were the handicapped students in this study interacted with by their nonhandicapped peers, but both types of students perceived the interaction to be supportive, friendly, and facilitative of academic achievement.

There is a theoretical rationale for predicting that the interaction between handicapped and nonhandicapped students in cooperative learning groups will promote increased rejection of the handicapped students by their nonhandicapped peers. Deutsch's (1962) theory would predict that when a group member frustrates the efforts of other members to achieve the group's goal, the member will be disliked. Johnson and Johnson (1972) modified Deutsch's theory by demonstrating that the expectation that the group member will attempt to facilitate the achievement of the group's goal (even when in fact the member frustrated goal achievement) leads to interpersonal attraction. Placing students with severe learning or emotional problems in cooperative groups could cause considerable frustration on the part of other group members either by not being able to do the work or by obstructing the goal achievement efforts of nonhandicapped members. The results of this study indicate that despite the academic and behavioral limitations of the handicapped students, they were included in the groups' work and, most importantly, sought out more for contact during free-time, free-choice situations by nonhandicapped peers in the cooperative condition than in the individualistic condition. This finding is important, not only because it provides evidence that it is not academic ability that promotes being liked in cooperative learning groups, but also because it provides evidence that the interpersonal attraction developed within cooperative groups is strong enough to carry over into postinstructional situations. These results may lessen some of the doubts educators have expressed concerning the generalizability of interpersonal attraction between handicapped and nonhandicapped students in mainstreamed situations (Johnson & Johnson, 1980).

In the previous research there is a complete lack of evidence as to whether collaborative experiences between handicapped and nonhandicapped students will increase the willingness and ability of handicapped students to participate actively in future learning situations with new nonhandicapped peers. The results of this study suggest that they will.

There has been some concern that the placement of handicapped students in the regular classroom and in heterogeneous cooperative learning groups will inhibit the achievement of the nonhandicapped students. The results of this study indicate the opposite. There was more on-task behavior in the cooperative than in the individualistic condition.

This study's results are all the stronger due to the random assignment of students to conditions, the use of highly trained teachers to conduct the instruction, the rotation of teachers across conditions, the specific operationalizations of the cooperative and individualistic conditions, and the behavioral nature of several of the dependent variables.

The results of this study have important implications for educational practice. In many classrooms mainstreaming is being conducted in a highly individualistic way, so that the handicapped students work on their own, on materials more simple than those of their classmates, and with a minimum of interaction with their classmates (Johnson & Johnson, 1980). The results of this study suggest that cooperative learning procedures should be utilized when handicapped students are mainstreamed into the regular classroom.

REFERENCES

ANDERSON, G. *Assessment of learning environments: A manual for "learning environment inventory" and the "my class inventory."* Halifax, Nova Scotia: Atlantic Institute of Education, 1973.

BALLARD, M., CORMAN, L., GOTTLIEB, J., & KAUFMAN, M. Improving the social status of mainstreamed retarded children. *Journal of Educational Psychology*, 1977, 69, 605–611.

COOPER, L., JOHNSON, D. W., JOHNSON, R., & WILDERSON, F. Effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. *Journal of Social Psychology*, 1980, 111, 243–252.

DEUTSCH, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln: Univ. of Nebraska Press, 1962. Pp. 275–320.

GOTTLIEB, J., & BUDOFF, A. Social acceptability of retarded children in nongraded schools differing in architecture. *American Journal of Mental Deficiency*, 1973, 78, 15–19.

HARRIS, F., & LAHEY, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. *Behavior Research and Therapy*, 1978, 11, 523–526.

IANO, R., AYERS, D., HELLER, H., MCGETTIGAN, J., & WALKER, V. Sociometric status of retarded children in an integrated program. *Exceptional Children*, 1974, 40, 267–271.

JOHNSON, D. W. *Educational psychology*. Englewood Cliffs, N.J.: Prentice–Hall, 1979.

JOHNSON, D. W., & JOHNSON, R. *Learning together and alone: Cooperation, competition, and individualization*. Englewood Cliffs, N.J.: Prentice–Hall, 1975.

JOHNSON, D. W., & JOHNSON, S. Effects of attitude similarity, expectation of goal facilitation, and actual goal facilitation on interpersonal attraction. *Journal of Experimental Social Psychology*, 1972, 8, 197–206.

JOHNSON, R., & JOHNSON, D. W. The social integration of handicapped students into the mainstream. In M. Reynolds (Ed.), *Social environment of the schools*. Reston, Va: Council for Exceptional Children, 1980. Pp. 9–38.

JOHNSON, R., RYNDERS, J., JOHNSON, D. W., SCHMIDT, B., & HAIDER, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. *American Educational Research Journal*, 1979, 16, 161–168.

MARTINO, L., & JOHNSON, D. W. Effects of cooperative versus individualistic instruction on interaction between normal-progress and learning-disabled students. *Journal of Social Psychology*, 1979, 107, 177–183.

PORTER, R., RAMSEY, B., TREMBLAY, A., IACCOBO, M., & CRAWLEY, S. Social interactions in heterogeneous groups of retarded and normally developing children: An observational study. In B. Sackett (Ed.), *Observing behavior: Theory and applications in mental retardation*. Baltimore: Univ. Park Press, 1978. Pp. 311–328.

STEELE, J., HOUSE, E., LAPEN, S., & KERMIS, T. *Instructional climate in Illinois gifted classes*. Urbana: University of Illinois, Center for Instructional Research and Curriculum Evaluation, 1970.

TALMAGE, H., & WAXMAN, H. *Principals as cooperative leaders* (Tech. Rep. No. 131). Chicago: University of Illinois, Chicago Circle, Office of Evaluation Research, August 1980.

Effects of Cooperative and Individualistic Instruction on the Relationships and Performance of Handicapped and Nonhandicapped Students[1]

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Running Head: Cooperative

Abstract

The effects of cooperative and individualistic learning experiences were compared on interpersonal attraction between handicapped and nonhandicapped eleventh-grade students and their achievement. Thirty-one students were assigned to conditions on a stratified random basis controlling for handicap, ability, and sex. Students participated in one instructional unit for 55 minutes a day for 16 instructional days. A behavioral measure was taken for cross-handicapped interaction within the instructional situation. A number of attitude and achievement measures were also given. The results indicate that cooperative learning experiences, compared with individualistic ones, promote more cross-handicapped interaction during instruction, more interpersonal attraction between handicapped and nonhandicapped students, and higher achievement on the part of both handicapped and nonhandicapped students.

Effects of Cooperative and Individualistic Instruction on the Relationships and Performance of Handicapped and Nonhandicapped Students

Mainstreaming, the integration of handicapped students into the regular classroom, is based on the assumption that contact between handicapped and nonhandicapped students will result in constructive cross-handicapped relationships. Many educators and psychologists, however, have reservations about the efficacy of mainstreaming. They have questions concerning whether the handicapped students will be ignored and rejected by the nonhandicapped peers, whether the handicapped students will disrupt the work and decrease the achievement of nonhandicapped peers, and whether the nonhandicapped students will benefit in any way from their contact with handicapped peers. The current evidence, furthermore, is not encouraging. When handicapped students are placed in the regular classroom they tend to be perceived by their nonhandicapped peers in negative and prejudiced ways and not related to constructively (e.g., Gottlieb & Budoff, 1973; Iano, *et. al.*, 1974; Porter, *et. al.*, 1978). Simply placing handicapped students in the regular classroom does not seem to be enough to build positive relationships between handicapped and nonhandicapped peers. Classroom interventions are needed that require handicapped and nonhandicapped students to interact with each other in constructive and positive ways.

It may be argued that the way in which instructional goals are structured controls the nature of student-student interaction, and that different student-student interaction patterns will lead to different outcomes for mainstreaming (Deutsch, 1949; Johnson & Johnson, 1975). Two of the ways in which instructional goals may be structured are cooperatively and individualistically. In a cooperatively structured learning situation students' goal attainments are positively correlated; when one student achieves his or her goal, all others with whom he or she is cooperatively linked achieve their goals. In an individualistically structured learning situations students' goal attainments are unrelated and each students' rewards are contingent on his or her performance irrespective of the quality of performance of other students.

For elementary and junior high school students, there is some evidence that cooperative learning experiences, compared with "traditional," competitive, and individualistic ones, promote more positive relationships between handicapped and nonhandicapped students (Ballard, et. al., 1977; Cooper, et. al., 1980; Johnson, et. al., 1979; Martino & Johnson, 1979). Despite this research, however, there are theoretical and practical issues that need to be clarified by further empirical work.

Deutsch's (1949) original theory stated that when group members facilitate the achievement of each other's goals, a positive cathexis will result among group members; but when group members frustrate each other's goal achievement, a negative cathexis will result among group members and they will dislike each other. Handicapped students, who are educable retarded or who have severe learning disabilities or emotional-behavioral problems, may interrupt the nonhandicapped students' academic work and lower their achievement either by not being able to do the work or by obstructing the efforts of the nonhandicapped students to learn. Deutsch's theory would thus predict that placing academically handicapped and emotionally-disturbed students in cooperative learning groups with nonhandicapped peers may result in obstruction of the nonhandicapped students' goal achievement and, therefore, rejection and dislike of handicapped students.

Johnson and Johnson (1972) modified Deutsch's theory somewhat by demonstrating that the expectation of goal facilitation leads to interpersonal attraction even when other group members frustrate the achievement of one's goals. These results imply that handicapped students who are part of a cooperative learning group will be liked by their nonhandicapped peers even if the handicapped students can not do the work or disrupt the efforts of the nonhandicapped students to achieve. The expectation that the handicapped students want to help achieve the goal and are part of the cooperative group is enough for positive cathexis to result.

This study will provide further evidence concerning the two positions. If Deutsch's original theory is correct, the presence of handicapped students in the cooperative learning groups will frustrate the nonhandicapped efforts to achieve, resulting in their disliking their handicapped peers. If the Johnson and Johnson modification is correct, handicapped students will be liked by nonhandicapped collaborators regardless of whether their achievement is affected by their handicapped peers.

There is no existing evidence that nonhandicapped students benefit cognitively or socially from contact with handicapped peers. One possibility, however, is that contact with handicapped peers may increase the ability of nonhandicapped students to take the perspective of the handicapped students in their classroom. The development of perspective-taking ability is considered by many developmental psychologists as essential for growth in cognitive and moral reasoning (Kohlberg, 1969; Piaget, 1950) and general social development (Johnson, 1979). If contact with handicapped students does in fact increase the perspective-taking ability of nonhandicapped students, then it may be assumed that the nonhandicapped students benefit in terms of cognitive and social development from mainstreaming.

The previous studies on the impact of cooperative learning experiences on mainstreaming provide almost no evidence concerning whether nonhandicapped students include their handicapped peers in the group's work or whether handicapped students are ignored and not interacted with. There is also no evidence concerning whether the presence of handicapped students in the cooperative groups disrupts the academic work of nonhandicapped students. There is a need, therefore, to measure directly the amount of interaction between handicapped and nonhandicapped students and the amount of off-task behavior occurring in the cooperative groups.

The purpose of this study is to extend and corroborate the previous research on the impact of cooperative learning experiences, compared with individualistic ones, on the relationships between handicapped and nonhandicapped students. By focusing on high school students and including dependent variables (amount of cross-handicapped interaction, amount of off-task behavior, achievement, cross-handicapped helping, perspective-taking, and cross-handicapped liking) that add to the previous research, this study may clarify some of the practical questions concerning the advisability of mainstreaming and resolve some of the theoretical questions concerning the use of cooperative learning experiences to promote interpersonal attraction among heterogeneous peers.

Method

Subjects

Subjects were 31 students from an eleventh-grade math class in a midwestern metropolitan area school district. The sample consisted of 13 females and 18 males, of which 6 were handicapped (3 being classified as having severe learning and behavioral problems and 3 being classified as educable mentally retarded). All students were assigned randomly to conditions stratifying for sex, ability (as determined from teacher ratings of general achievement), and handicap. Three handicapped students were assigned to each condition. There were 9 males and 6 females assigned to the cooperative condition and 9 males and 7 females assigned to the individualistic condition. There were an equal number of high, medium, and low ability students in each condition.

Independent Variable

The independent variable consisted of a cooperative and an individualistic condition. In the cooperative condition students were instructed to work together as a group, completing one assignment sheet while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in three groups of four members and one group of three members. The groups of four had one handicapped member. The groups were also balanced for sex and math ability. In the individualistic condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually.

Procedure

Students in each condition were together for 55 minutes per day for 16 instructional days. The student was conducted the during the last four weeks of the school year. All the students had been in the math class for approximately eight weeks prior to the study. Each condition was assigned a separate classroom comparable in size. The content of the math curriculum was identical for the two conditions, consisting of units on percent reduction and unit cost problems, purchasing and insuring a car, and purchasing combinations of consumer items. The first three days of each week the students completed work sheets either individualistically or cooperatively. The fourth day a review worksheet was completed. The fifth day students were tested individually in both conditions on the week's material. In the cooperative condition the individual scores were averaged to obtain a group score. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. At the completion of the study the students completed the experimental questionnaires.

Research Personnel

Two teachers participated in the study. One teacher was the students' regular math teacher and one teacher was a certified teacher hired to help conduct the study. Both teachers had received over 60 hours of training in how to implement the two experimental conditions. At the midpoint of the study the two teachers switched conditions, so that both spend an equal amount of instructional time in each condition. The teachers were originally randomly assigned to conditions.

Four research assistants observed (on a daily basis in both conditions) off-task behavior and the frequency of nonhandicapped students' comments directed toward handicapped peers. The observers (two males and two females) were given over ten hours of training in the use of the observation instrument. Observers attended training sessions until their interrater reliability was over 85 percent (using the Harris and Lahey [1978] method for combining and weighting occurrence and nonoccurrence of agreement).

Dependent Variables

The dependent variables were: off-task behavior, incondition observation of cross-handicap interaction, a sociometric measure of cross-handicap helping, a sociometric measure of cross-handicap liking, achievement, and four attitude scales. The off-task and incondition observation measures were used in the following way. In each condition, two observers used a sequential time-sampling method of observation employing ten second recording intervals. A five second interval was taken to record the behavior. The observers then moved to the next target student and repeated the procedure. Each student was observed for six cycles daily. The students were observed in a predetermined, random order that was changed daily. The observer agreement was 88 percent during the study (using the Harris and Lahey [1978] method). The observers first recorded whether the student's behavior was off-task. If the behavior was on-task, the nature (positive or negative) and target of the verbal behavior was recorded. During the study, there was one instance of negative interaction in both conditions and, therefore, it was dropped from the analysis. To derive an index of cross-handicap interaction, the actual number of verbal comments by nonhandicapped students directed toward their handicapped peers was divided by the number of intervals of observation and the number of nonhandicapped students in the condition.

The sociometric helping measure consisted of asking students to write down the names of the students who had helped them learn, and the names of the students they had helped learn. To derive an index of cross-handicap helping, the total number of cross-handicap nominations were divided by the number of students from the other group (handicapped or nonhandicapped) in the condition.

The sociometric liking measure consisted of asking students to rate on a five-point scale how much they would like to work with each member of their condition.

The achievement measure was obtained by giving the students in each condition an identical achievement test each week on the math material covered during that week. At the end of the study the total number of questions correct for each student who had taken all four tests was determined.

Finally, four attitude scales were given to all students. A cooperation scale consisted of questions dealing with working with other students and helping each other learn. An individualistic scale consisted of questions dealing with working alone without interacting with other students. Both of these scales were developed by Talmage and Waxman (1980). A difficulty scale consisted of questions dealing with how hard the math lessons were (Anderson, 1973). These three scales had four items each and students answered "yes" or "no" to each item. A two-item, peer support and encouragement for learning scale developed by the authors was given; students responded on a five-point scale as to whether other students liked to help them learn and cared about how much they learned.

Analyses

The data were first analyzed by a two-way ANOVA that included the two experimental conditions and handicapped versus nonhandicapped students. No significant differences were found between handicapped and nonhandicapped students and, therefore, the data were reanalyzed by t-tests between the two experimental conditions. Achievement was analyzed separately by a two-way ANOVA to highlight the differences between the handicapped and nonhandicapped students in each condition. The perspective-taking measure was analyzed separately with a chi-square procedure.

Experimental Checks

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

Results

The first dependent variable was the proportion of verbal comments by nonhandicapped students directed toward a handicapped peer. From Table 1 it may be seen that handicapped students in the cooperative condition received more comments from their nonhandicapped peers than did the handicapped students in the individualistic condition, $t(4) = 4.71$, $p < .01$. For every statement nonhandicapped students in the individualistic condition addressed to their nonhandicapped peers, there were over four statements in the cooperative condition.

The second dependent variable was the proportion of off-task behaviors in the two-conditions. The data in Table 1 indicate that students in the individualistic condition were off-task for a greater proportion of observations than were the students in the cooperative condition, $\underline{t}(29) = 3.30$, $\underline{p} < .01$.

The third dependent variable was the number of nominations concerning the giving and receiving of help between handicapped and nonhandicapped students. From Table 1 it may be seen that students in the cooperative condition indicated more cross-handicap helping than did the students in the individualistic condition, $\underline{t}(28) = 1.63$, $\underline{p} < .10$. Handicapped students in the cooperative condition were named by their nonhandicapped peers as often for giving help as for receiving help. If a student was named by a respondent for both giving and receiving help, the student was counted only once in the analysis.

The fourth dependent variable was the sociometric rating of peers from the other group (handicapped or nonhandicapped). The data in Table 1 indicate that students in the cooperative condition rated members of the other group (handicapped or nonhandicapped) higher as desired work partners than did the students in the individualistic condition, $\underline{t}(29) = 2.72$, $\underline{p} < .01$.

The fifth dependent variable was achievement. In the cooperative condition the handicapped students answered on the average 183.50 questions correctly while the nonhandicapped students answered an average of 200.63 questions correctly. In the individualistic condition the handicapped students answered on the average 140.50 questions correctly and the nonhandicapped students answered an average of 179.30 questions correctly. The results of a two-way ANOVA indicates that students in the cooperative condition achieved at a higher level than did the students in the individualistic condition, $F(1,18) = 2.68$, $p < .10$, and that nonhandicapped students achieved somewhat higher than did the handicapped students, $F(1,18) = 2.35$, $p < .15$.

The sixth dependent variable was perspective-taking accuracy. Nonhandicapped students in the cooperative condition more accurately took the perspective of their handicapped peers than did the nonhandicapped students in the individualistic condition, $X^2(28) = 7.45$, $p < .01$. Nonhandicapped students in the cooperative condition were incorrect in their responses 10 percent of the time, compared with 34 percent by the nonhandicapped students in the individualistic condition.

Finally, the data in Table 1 indicate that students in the cooperative condition, compared with students in the individualistic condition, perceived their classroom to be more cooperative, $t(26) = 7.62$, $p < .01$, and less individualistic, $t(26) = 4.50$, $p < .01$. Students in the cooperative condition also perceived the math assignments to be less difficult, $t(26) = 2.61$, $p < .01$, and perceived more peer support for learning, $t(26) = 1.87$, $p < .05$, than did the students in the individualistic condition.

Insert Table 1 About Here

Discussion

The generalizability of the results of this study is limited by the age of the students studied, the curriculum materials used, the length of the study, and the specific operationalizations of the independent and dependent variables.

The results of this study indicate that cooperative learning experiences, compared with individualistic ones, promote more interaction between handicapped and nonhandicapped students during instruction. The interaction is characterized by greater perceived helping between handicapped and nonhandicapped students, less off-task behavior, and stronger beliefs that students work together and help each other (cooperation scale), that students do not work alone without interacting with peers (individualistic scale), that the academic work is less difficult (difficulty scale), and that one's peers encourage and support academic learning (peer academic support scale). In addition, students in the cooperative condition indicated more cross-handicapped liking and achieved at a higher level than did the students in the individualistic condition. These results have both theoretical and practical implications.

Deutsch's (1949) original theory implies that mainstreaming may result in increased rejection of handicapped students when their lack of ability or emotional problems interfere with the achievement of their nonhandicapped peers. The handicapped students in this study were educable retarded or had severe learning disabilities and emotional-behavioral problems. Their achievement was lower than that of their nonhandicapped peers. Yet their more limited ability to do the work, and the fact that their performance lowered the group's grade, did not result in their being rejected or ignored by their nonhandicapped peers. These results support the Johnson and Johnson (1972) modification of Deutsch's theory, as the students in the cooperative condition had stronger perceptions that they were working together and trying to help each other learn (expectation of goal facilitation), the nonhandicapped students perceived their handicapped peers as more frequently giving as well as receiving help (effort expended to facilitate goal achievement), and in fact the handicapped students were liked more in the cooperative than in the individualistic condition. Despite their academic limitations and their history of severe behavioral problems, the handicapped students were included in the work of the cooperative groups, were given and gave help and support, and were liked.

In the previous research on the effects of cooperative learning experiences (compared with individualistic and competitive ones) on mainstreaming, there has been almost no examination of whether handicapped and nonhandicapped students do in fact interact with each other and, if so, what the nature of that interaction is. The results of this study indicate that nonhandicapped students in the cooperative condition interacted more with their handicapped peers than did the nonhandicapped students in the individualistic condition, and the interaction seemed to be characterized by mutual helping as well as a sense of working together and mutual support and encouragement for learning math. These findings corroborate and extend the previous research on cooperative learning and mainstreaming.

There is no previous evidence that the nonhandicapped students gain cognitively or socially from their contact with nonhandicapped peers. The results of this study provide evidence that nonhandicapped students who work collaboratively with handicapped peers are more accurate in taking the perspective of their handicapped peers than are nonhandicapped students who work individualistically in the same class as handicapped students. These results indicate that mainstreaming, when it involves heterogeneous cooperative learning groups, may provide important developmental experiences for nonhandicapped students.

There has been some concern that the placement of educable retarded and severe learning disabled and emotionally disturbed students in the regular classroom and in heterogeneous cooperative learning groups will inhibit the achievement of the nonhandicapped students. The results of this study indicate just the opposite. Nonhandicapped students in the cooperative condition achieved at a higher level than did the nonhandicapped students in the individualistic condition. There was less off-task behavior in the cooperative condition and students perceived the math lessons to be easier. In addition, the handicapped students in the cooperative condition achieved higher than did the handicapped students in the individualistic condition. Both nonhandicapped and handicapped students seem to benefit academically from working together.

There is no previous evidence that cooperative learning experiences will promote constructive relationships among nonhandicapped and handicapped high school students. The results of this study thus extend the previous research on elementary and junior high school students.

The results of this study have several important practical implications. When cooperative learning groups are used to integrate handicapped students into the regular classroom, the findings of this study indicate: that the handicapped students will not be ignored and leftout, but rather will be interacted with; that the presence of handicapped students in the regular classroom will not disrupt the work of nonhandicapped students or pull down their achievement; that the handicapped students will not be rejected but rather will be liked; that mainstreaming can be successful at the high school level; and that nonhandicapped students can benefit from their interaction with handicapped peers through increased perspective-taking abilities.

References

Anderson, G. Assessment of learning environments: A manual for "learning environment inventory" and the "my class inventory." Halfax, Nova Scota: Atlantic Institue of Education, 1973.

Ballard, M., Corman, L., Gottlieb, J., & Kaufman, M. Improving the social status of mainstreamed retarded children. Journal of Educational Psychology, 1977, 69, 605-611.

Cooper, L., Johnson, D. W., Johnson, R., & Wilderson, F. Effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. Journal of Social Psychology, 1980, 111, 243-252.

Deutsch, M. A theory of cooperation and competition. Human Relations, 1949, 2, 129-152.

Gottlieb, J., & Budoff, A. Social acceptability of retarded children in nongraded schools differing in architecture. American Journal of Mental Deficiency, 1973, 78, 15-19.

Harris, F., & Lahey, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. Behavior Research and Therapy, 1978, 11, 523-526.

Iano, R., Ayers, D., Heller, H., McGettigan, J., & Walker, V. Sociometric status of retarded children in an integrated program. Exceptional Children, 1974, 40 267-271.

Johnson, D. W. Educational psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1979.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition and individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Johnson, D. W., & Johnson, S. Effects of attitude similarity, expectation of goal facilitation, and actual goal facilitation on interpersonal attraction. Journal of Experimental Social Psychology, 1972, 8, 197-206.

Johnson, R., Rynders, J., Johnson, D. W., Schmidt, B., & Haider, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. American Educational Research Journal, 1979, 16, 161-168.

Kohlberg, L. Stage and sequence: The cognitive-developmental approach to socialization. In D. Goslin (Ed.), Handbook of socialization theory and research. Chicago: Rand-McNally, 1969, 347-480.

Martino, L., & Johnson, D. W. Effects of cooperative versus individualistic instruction on interaction between normal-progress and learning-disabled students. Journal of Social Psychology, 1979, 107, 177-183.

Piaget, J. The psychology of intelligence. New York: Harcourt, Brace, 1950.

Porter, R., Ramsey, B., Tremblay, A., Iaccobo, M., & Crawley, S. Social interactions in heterogeneous groups of retarded and normally developing children: An observational study. In B. Sackett (Ed.), Observing behavior: Theory and applications in mental retardation. Baltimore: University Park Press, 1978, 311-328.

Talmage, H., & Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle, Office of Evaluation Research, Technical Report 131, August, 1980.

Footnote

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Table 1

Mean Responses for Interaction and Attitude Measures

Dependent Variables	Cooperative	Individualistic	t-Value
Instructional Interaction[a]	.253	.050	4.71***
Off-Task Behavior[b]	.035	.113	3.30***
Helping Nominations[c]	.263	.128	1.63*
Sociometric Rating	3.563	3.236	2.72***
Cooperation	11.642	6.714	7.62***
Individualistic	6.000	10.000	4.50***
Difficulty	5.714	7.357	2.61***
Peer Academic Support Scale	6.86	5.93	1.87**

*$p < .10$; **$p < .05$; ***$p < .01$

[a] Number of instances of verbal behavior being directed towards a handicapped student by a nonhandicapped peer divided by the number of observation intervals and the number of nonhandicapped students in the condition.

[b] Number of off-task behaviors divided by the number of intervals of observation.

[c] Number of students nominated as giving help to or receiving help from a peer from the other group (handicapped or nonhandicapped) divided by the number of students in the condition.

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EFFECTS OF COOPERATIVE AND INDIVIDUALISTIC INSTRUCTION ON THE ACHIEVEMENT OF HANDICAPPED, REGULAR, AND GIFTED STUDENTS*[1]

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SUMMARY

The effects of cooperative and individualistic learning experiences were compared on achievement of academically handicapped, normal-progress, and gifted sixth-grade students. Fifty-five students were assigned to conditions on a stratified random basis controlling for ability and sex. They participated in one instructional unit for 65 minutes a day for five instructional days. The results indicate that cooperative learning experiences promoted higher achievement, greater retention, more positive attitudes among students, and higher self-esteem than did individualistic learning experiences.

A. INTRODUCTION

As a result of PL-94-142, handicapped students are being mainstreamed into regular classrooms throughout the United States. Many educators and psychologists, however, have been concerned about the impact of the presence of handicapped students on the achievement of regular and gifted students. The fear is that their presence in the classroom will disrupt and lower the achievement of the nonhandicapped students, especially the gifted. Possibly mainstreaming pits the welfare of handicapped students against the welfare of gifted and regular students, so that helping the handicapped necessitates lowering the quality of academic education of regular and gifted students. There is a need to obtain evidence on two aspects of this issue: (*a*) Will the presence of handicapped students in the regular classroom affect the achievement of the regular and gifted students?

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and (*b*) Will the way in which instruction is organized moderate or mediate the impact of the presence of handicapped students on the achievement of nonhandicapped students?

Two of the ways in which classroom instruction may be organized are cooperatively and individualistically (3, 6). In a *cooperatively* structured learning situation students' goal attainments are positively correlated; when one student achieves his goal, all others with whom he is cooperatively linked achieve their goals. In an *individualistically* structured learning situation students' goal attainments are independent; when one student achieves his goal, the goal attainment of other students is unaffected.

When handicapped, regular, and gifted students are placed together in cooperative learning groups, their interaction with each other will be maximized. Whatever positive or negative impact mainstreaming has on the achievement of handicapped and nonhandicapped students, it should be most apparent when students work together in heterogeneous cooperative groups. The interaction between handicapped and nonhandicapped students may be minimized when learning is structured individualistically. This should reduce any impact the presence of handicapped students has on the regular and gifted students.

Cooperative learning experiences tend to promote higher achievement than do individualistic learning experiences (8). Yet common sense seems to indicate that when regular and gifted students have to work with handicapped peers, their academic progress would be slowed down. Currently, there is no evidence comparing the actual impact of the presence of handicapped students on the achievement of regular and gifted students in cooperative and individualistic learning situations. The purpose of this study is to provide such evidence.

It is also of interest to determine whether the increased interaction between handicapped and nonhandicapped students in the cooperative learning groups promotes positive or negative relationships and feelings about oneself. Previous evidence would indicate that cooperative learning experiences would result in higher self-esteem (7) and would promote more positive relationships between handicapped and nonhandicapped students than would individualistic learning experiences (1, 2, 9, 10). These variables have also been examined in the present study.

B. METHOD

1. *Subjects*

Fifty-five sixth-grade students from a Midwestern, suburban, middle school participated in the study; seven of them were handicapped, 14 were gifted, and 34 were regular students; all were from middle-class families. *S*s were assigned randomly to conditions, and were stratified on the bases of sex and ability. There were nearly equal numbers of males and females in each condition: in the cooperative condition, three handicapped students, 17 regular students, and eight gifted students; in the individualistic condition, four handicapped, 17 regular, and six gifted students.

2. *Independent Variables*

Two independent variables were included: instructional goal structure and the special education classification of the students. The two goal structures were included: cooperative and individualistic. In the *cooperative* condition *S*s were assigned to groups of four, given one set of curriculum materials for each group, and instructed to work together as a group, completing one group report and studying for an achievement test while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were randomly assigned to seven groups of four members, stratified on the bases of sex and ability. All groups had at least one gifted member and three groups had a handicapped member. All groups were balanced for sex and reading ability. In the *individualistic* condition *S*s were each given one set of curriculum materials and instructed to read and study the materials to prepare an individual report and to study for an achievement test. They were instructed to work on their own, avoiding any interaction with other *S*s, and with the teacher praising and rewarding them individually.

The special education classifications of the students were as follows: handicapped, regular, and gifted. They were defined by the special education personnel of the school as being handicapped, normal-progress, or gifted on the basis of their academic potential and performance. The average Iowa Reading Comprehension Grade Equivalent Score for the handicapped *S*s was 2.90 and for the gifted, 8.44.

3. *Procedure*

*S*s in each condition were together for 65 minutes a day for five instructional days in January. Each condition was assigned a separate classroom comparable in size. The content of the curriculum unit was identical for the two conditions, consisting of a conservation and land use unit on the Boundary Waters Canoe Area in Minnesota. Each day the teachers would explain the day's task to the *S*s, distribute the appropriate materials, and review their goal structure. At the end of the session the completed work and all materials were collected. The *S*s were given four days to read and study the assigned materials and to write a report on the Boundary Waters Canoe Area. One day was spent testing achievement and assessing attitudes. Four weeks after the experimental sessions had ended all *S*s were retested for retention of the information learned. The self-esteem measure was given one week after the end of the experimental session.

4. *Research Personnel*

Two teachers participated in this study. They were randomly assigned to conditions. Each had 30 hours of training in how to teach the conditions, the teacher script and role were thoroughly discussed with them before each session, and the teachers participated in a pilot study where the procedures were practiced for five instructional sessions. Both teachers had over seven years of teaching experience.

Four graduate students participated as observers (*O*s). Prior to the study the *O*s were trained to identify the specific characteristics of each condition. There was 100 percent reliability between pairs of *O*s as to whether the teachers were appropriately implementing the conditions.

5. *Dependent Variables*

The dependent variables were as follows: achievement, retention, liking for peers, perception that peers encourage and support academic learning, perception that peers accept and approve of one as a person, and self-esteem. The *achievement* test was designed to test the six levels of understanding recommended by Ebel (4). The test was piloted with 28 sixth-grade students not participating in the study; unreliable items were eliminated, leaving 20 questions in the test. The questions were based solely on information contained in the study materials. The *retention* test was identical to the achievement test, given four weeks after the study had ended.

Liking for peers was measured by a single Likert five-point scale item, "I like the other students in this class." *Peer academic encouragement* was measured by a two-item scale measuring the extent (on five-point scales) to which *S*s felt encouraged to learn by their peers. *Peer personal acceptance* was measured by a four-item scale indicating the extent (on five-point scales) *S*s felt personally accepted by the other *S*s in their condition. *S*s' *self-esteem* was measured by a three-item scale indicating the extent (on five-point scales) to which they believed they were competent and worthwhile students. The three attitude scales were taken from the Minnesota School Affect Assessment (5).

6. *Analyses*

A three-way ANOVA was used to test for main effects and interactions among three factors: treatment, ability, and sex. The ANOVA calculations were performed with the use of the regression option due to unequal number of observations. Sex did not have a significant main or interaction effect for any dependent variable and was, therefore, dropped from the analysis. A two-way ANOVA was then conducted to test for main effects and interactions between goal structures and special education designation, with the use of the regression option due to unequal number of observations.

7. *Operations Checks*

To verify that teachers appropriately implemented each condition and that *S*s behaved appropriately, two graduate students observed each condition daily. *S*s were also given a self-evaluation checklist each day noting whether they behaved appropriately to their condition. On the bases of the observations and checklist results it may be concluded that teachers appropriately implemented the conditions and that *S*s behaved appropriately.

C. RESULTS

The results (see Table 1) indicate that handicapped, regular, and gifted *S*s in the cooperative condition achieved higher on the achievement test $F(1, 49) = 20.42$, $p < .01$, and on the retention test, $F(1, 47) = 22.65$, $p < .01$, than did their counterparts in the individualistic condition. There was a significant effect for ability on both the achievement test, $F(2, 49) = 6.98$, $p < .01$, and the retention test, $F(2, 47) = 16.38$, $p < .01$. The ability effect was much stronger in the individualistic than in the cooperative condition, as the handicapped *S*s in the cooperative condition achieved at about the same level as their normal-progress classmates.

TABLE 1
MEAN RESPONSES FOR ACHIEVEMENT AND ATTITUDE MEASURES

	Cooperative			Individualistic		
Measure	Handicapped	Regular	Gifted	Handicapped	Regular	Gifted
Achievement	12.33	12.82	14.88	4.25	9.41	12.33
Retention	10.67	13.07	15.63	3.75	9.00	13.33
Liking for other students	3.33	3.93	4.33	3.33	2.93	3.33
Peer academic support	6.50	7.71	7.40	4.67	4.73	5.33
Peer personal acceptance	14.67	14.57	16.67	9.00	11.81	15.00
Self-esteem	12.00	11.31	11.75	9.00	10.87	10.67

The attitude results in Table 1 indicate that *S*s in the cooperative condition liked each other more than did the *S*s in the individualistic condition, $F(1, 43) = 3.46$, $p < .10$. Those in the cooperative condition also believed that their peers encouraged academic achievement more, $F(1, 39) = 16.14$, $p < .01$, believed that their peers were more accepting of them as persons, $F(1, 41) = 9.37$, $p < .01$, and had higher self-esteem, $F(1, 40) = 5.06$, $p < .05$. There was an ability effect on the peer personal acceptance scale, $F(2, 41) = 4.19$, $p < .05$, with the handicapped *S*s in the individualistic condition feeling the least accepted personally by their peers.

D. DISCUSSION

The generalizability of the results is limited by the age of the *S*s studied, the curriculum materials used, the length of the study, and the specific operationalizations of the independent and dependent variables. Educators and psychologists who fear that the achievement of normal-progress and gifted students will be lower when they work with handicapped students, however, may experience some relief from these results. Participation in heterogeneous cooperative learning groups containing handicapped, normal-progress, and gifted students increased the academic performance of all three types of students relative to their working individualistically. Previous research indicating that cooperative learning experiences promote higher achievement than do individualistic learning experiences is thus supported. The handicapped *S*s especially seemed to benefit academically from their participation in heterogeneous cooperative learning groups. The achievement results are all the more important as this may be the first study to include academically gifted and handicapped students in the same conditions.

There is also some concern among educators as to whether mainstreaming will lead to destructive relationships between handicapped and nonhandicapped students. The results indicate just the opposite. Cooperative learning experiences, compared with individualistic ones, promoted peer relationships characterized by encouraging and supporting academic learning and personally accepting, caring about, and liking each other. Handicapped students in particular felt more accepted and supported when they were part of heterogeneous cooperative learning groups, although the normal-progress and the gifted students also felt more support and caring for and from their peers. Students working in cooperative learning groups tended to develop higher self-esteem as students than did comparable counterparts working individualistically. This finding supports the previous research on cooperative learning. Handicapped students seemed to benefit the most in terms of self-esteem from their cooperative learning experiences.

REFERENCES

1. BALLARD, M., CORMAN, L., GOTTLIEB, J., & KAUFMAN, H. Improving the social status of mainstreamed retarded children. *J. Educ. Psychol.*, 1977, **69**, 605-611.
2. COOPER, L., JOHNSON, D. W., JOHNSON, R., & WILDERSON, F. Effects of cooperative, competitive, and individualistic experiences on interpersonal attraction among heterogeneous peers. *J. Soc. Psychol.*, 1980, **111**, 243-252.
3. DEUTSCH, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), *Neraska Symposium on Motivation*. Lincoln, Neb.: Univ. Nebraska Press, 1962. Pp. 275-320.
4. EBEL, R. Essentials of Educational Measurement. Englewood Cliffs, N.J.: Prentice-Hall, 1972.
5. JOHNSON, D. W. Affective outcomes. In H. Walberg (Ed.), *Evaluating Educational Performance*. Berkeley, Calif.: McCutchan, 1974. Pp. 99-112.
6. JOHNSON, D. W., & JOHNSON, R. Learning Together and Alone: Cooperation, Competition, and Individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.
7. JOHNSON, D. W., JOHNSON, R., & SCOTT, L. The effects of cooperative and individualized instruction on student attitudes and achievement. *J. Soc. Psychol.*, 1978, **104**, 207-216.
8. JOHNSON, D. W., MARUYAMA, G., JOHNSON, R., NELSON, D., & SKON, L. Effects of cooperative, competitive, and individualistic goal structures on achievement. *Psychol. Bull.*, 1981, in press.
9. JOHNSON, R., RYNDERS, J., JOHNSON, D. W., SCHMIDT, B., & HAIDER, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. *Amer. Educ. Res. J.*, 1979, **16**, 161-168.
10. MARTINO, L., & JOHNSON, D. W. Cooperative and individualistic experiences among disabled and normal children. *J. Soc. Psychol.*, 1979, **107**, 177-183.

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SECTION II

YEAR 2

Pulling the Group's Score Down: Does It Inevitably Lead to Rejection of the Handicapped in a Cooperative Situation?

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Running Head: Rejection in Cooperation

Abstract

The effects of nonhandicapped and handicapped students working cooperatively or individualistically were compared. A number of theories would predict that when nonhandicapped students collaborate with lower-achieving handicapped peers rejection and dislike will result. These theories were tested against a counter position that working collaboratively promotes liking regardless of differences in achievement. Forty-eight students (36 nonhandicapped and 12 handicapped) were assigned to conditions on a stratified random basis controlling for sex, social class, and ability level. They participated in the study for 55 minutes a day for 15 instructional days. The results indicate that cooperative learning experiences, compared with individualistic ones, promoted higher achievement and greater interpersonal attraction between handicapped and nonhandicapped students as well as more cross-handicap interaction focused on supporting and regulating efforts to learn and ensure active involvement of all students in the learning tasks.

Pulling the Group's Score Down: Does It Inevitably Lead to Rejection Of the Handicapped In a Cooperative Situation

There is evidence that more positive relationships are promoted between handicapped and nonhandicapped students within cooperative learning experiences than within "traditional," competitive, and individualistic learning experiences (Johnson, Johnson, & Maruyama, Note 1). When handicapped students perform at a lower level than their nonhandicapped peers, however, a number of theoretical positions hypothesize that cooperative learning experiences would tend to promote increased rejection of handicapped students by nonhandicapped collaborators, including contact theory, cooperation theory, frustration-aggression theory, and academic-learning-time theory. The active-encouragement position proposed by Johnson, Johnson, and Maruyama (1983), however, predicts that cooperation will promote acceptance and liking between handicapped and nonhandicapped collaborators regardless of the achievement level of the handicapped students. The purpose of this study is to examine the interactions between handicapped and nonhandicapped students in cooperative and individualistic learning situations and contrast the predictions of the different theoretical positions.

Contact theory states that cooperative learning experiences will lead to more positive attitudes and relationships among participants only if the participants are of equal status (Allport, 1954; Cook, 1969; Watson, 1947). When handicapped students have a lower academic performance level than the nonhandicapped students, unequal status is assumed and, therefore, contact theory would predict that more positive cross-handicap attitudes and relationships would not result.

Deutsch's (1949, 1962) original theory of cooperation predicts that when a group member frustrates the goal achievement efforts of the group, a negative cathexis results that is generalized to the low achiever and the low achiever is then disliked. Despite the large amount of research on cooperation, the "bunglers will be disliked in cooperation" hypothesis has generated little research. Frustration-aggression theory predicts that when nonhandicapped students work with handicapped peers they may become frustrated with the handicapped students' low achievement and will, therefore, become aggressive and negative towards them. From academic-learning-time theory (Denham & Lieberman, 1980) it may be predicted that having lower-achieving handicapped students in the same learning groups as nonhandicapped students may decrease the amount of on-task time within the groups, thus decreasing nonhandicapped students' achievement and resulting in their disliking their handicapped peers.

An alternative position is that when peers of different achievement levels work cooperatively they will become personally committed to each other's success through supporting, regulating, and providing feedback for their task efforts and through joint active involvement in achieving the group's goals, and that the personal commitment will result in increasing liking for each other regardless of achievement level. There is some evidence to support this active-encouragement position. Johnson and Johnson (1972) found that when subjects expected their partners to facilitate their goal accomplishment, they liked their partners irrespective of their partner's actual performance. Tjosvold, Johnson, and Johnson (1981) found that when low-ability members of cooperative groups were perceived as exerting effort to achieve the group's goal, they were liked by their higher achieving peers.

To test the validity of the theoretical positions outlined above, a study was undertaken to observe directly the interaction between handicapped and nonhandicapped students within cooperative and individualistic learning situations and measure the strength of their acceptance and liking for each other.

Method

Sample

The subjects were 48 fourth-graders from two different classrooms in a large innercity elementary school in a midwestern metropolitan area school district. The sample consisted of 12 handicapped students and 36 nonhandicapped students, 27 females and 21 males, and 24 middle class and 24 lower class students. The handicapped students were classified as learning disabled and emotionally disturbed. All students were randomly assigned to the two conditions stratifying for handicapping conditions, sex, social class, and ability level. There were 6 handicapped students, 13 females and 11 males, and 12 middle class and 12 lower class students, and an equal number of high, middle, and low achieving students in each condition.

Independent Variable

The independent variable was cooperative versus individualistic learning situations. In the cooperative condition students were instructed to work together as a group, completing one set of papers as a group while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in six groups of four students each on a stratified random basis, ensuring that each group contained a handicapped student and were relatively balanced for sex, social class, and ability level. In the individualistic condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually. Students were observed in clusters of four.

Procedure

Instructional sessions lasted 55 minutes a day for 15 days. Two separate classrooms comparable in size were used in the study. A social studies unit on the Boundary Waters Canoe Area of Minnesota was used as the curriculum. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. Both teachers followed a daily script detailing what they were to say and do. Teachers exchanged conditions at the midpoint of the study to control for possible teacher effects. Both teachers, therefore, spent an approximately equal amount of instructional time in each condition (7 days in one condition, 8 days in the other).

Research Personnel

Two teachers participated in the study. Both teachers were highly experienced in conducting cooperative and individualistic lessons and had received over 90 hours of training in how to structure the two conditions. Both were certified teachers. Four research assistants observed student oral interaction on a daily basis in both conditions. Each observer received 25 hours of training on the observation instruments. There were at least two observers in each condition each day. Observers rotated conditions so that they observed each condition an equal number of times. The research assistants observed the group in random order for two minutes each. They conducted interrater reliability checks during the classroom observation sessions. Interrater reliability was over 80 percent using the percentage method of agreement and disagreement for occurrence.

Dependent Variables

The dependent variables in this study are: achievement, oral interaction, social-schema measure of interpersonal attraction, distance-density measure of interpersonal attraction, sociometric-nominations measure of giving and receiving help, and several attitude scales. The achievement measure consisted of three tests, given after five, ten, and fifteen days of instruction. The tests contained 19, 17, and 24 objective questions respectively. The test items basically measured factual recall of the material studied. The tests were constructed by the research staff and the teachers involved in the study. Since there were no significant differences among the results of the three tests they were added together for a total score.

The peer regulation, feedback, support, and encouragement measure consisted of the observation of: (1) leading statements such as directives and suggestions that are aimed at influencing or controlling the task behavior of a peer (verbal imperatives, verbal instructions, and response demanding were all included in this measure); (2) statements aimed at encouraging, supporting, and accepting the task activities of a peer; and (3) feedback consisting of agree statements (where a student agreed with or confirmed the opinion, answer, or conclusion of another student) and disagree statements (where a student disagreed with or disconfirmed the opinion, answer, or conclusion of another student).

The active involvement in learning measure consisted of the observation of: (1) task-related questions, and (2) providing task-related information including the answer to a question.

The negative and off-task interaction measure consisted of the observation of: (1) negative statements that were hostile, rejecting, or ridiculing; and (2) off-task statements.

Finally, miscellaneous statements that did not fit into any other category were observed.

A free-time cross-handicap interaction measure was used to determine the frequency of cross-handicap interaction during the two 30 minute free-time sessions at the end of the study. The measure was designed to provide an index of the proximity of a handicapped student to other students in the condition. To be classified as an interaction, the handicapped student's nonhandicapped peers had to be in a two-meter radius of the handicapped student and the handicapped student had to be in conversation or involved in the same activity with the nonhandicapped students. Observers were provided with a randomized list (changed daily) of the students to be observed. Observers were rotated through the list as many times as possible during the free time period. The observers agreed on their classification 93 percent of the observation intervals during the study. To derive an index of cross-handicap interaction, the actual number of students involved in cross-handicap interaction was divided by the number of observations and the number of students from the other group (handicapped or nonhandicapped) in the condition.

A social-schema, figure-placement measure consisted of placing a classroom diagram in front of each student and giving them the names of all the other students in the condition (ordered randomly), each of which appeared on a sticker. The students were asked to imagine that it was free time in the class and instructed to place the stickers on the classroom diagram at the spots where the students would be playing in the room. They were then instructed to draw a circle around the groups of students who were engaged in an activity together. The total number of handicapped students engaged in an activity with handicapped students was recorded for each student.

The distance-density index (Zaidman, Note 2) measured the number of students within an area of constant size. The measure was designed to provide a numerical score for the social density of the immediate environment within a certain radius of the individual. A large DDI value indicates that there are many people in the proximity of the target individual. A ten-foot radius was broken up into a series of concentric zones of distance around the target student. Two numerical values were associated with each zone, one number for the area in front of the target student and another lower value for the area in back of the target student. The students were given two periods of free-time, each lasting 30 minutes, at the end of the study. Students were free to associate with anyone they wished to in the classroom.

The observers recorded the number of peers within a ten-foot radius of the target student. Thirteen students were observed in each condition. A larger DDI score was assigned to students in close proximity to and facing the target student.

The nomination helping measure consisted of asking students to write down the names of students who had helped them learn, and the names of the students they had helped learn. To derive an index of cross-handicap helping, the total number of cross-handicap nominations was divided by the number of students from the cross-handicap group in the condition.

A number of attitude scales were given to the students participating in the study. Three of the attitude scales were developed by the authors and used in a number of previous studies. Students responded to each item on a five-point agree-disagree scale. The peer-helping scale consisted of two items dealing with how much the student liked being helped by his or her peers. The peer-academic-support scale consisted of two items dealing with whether other students liked to help one learn and cared about how much one learned. The perceived-personal-success scale consisted of three items dealing with how successful the student felt as a student and how successful peers and teachers perceived the student to be as a student. Finally, two scales developed by Talmage and Waxman (Note 3) were given. The cooperation scale consisted of four questions dealing with working with other students and helping them learn. The individualistic scale consisted of four questions dealing with working alone without interacting with other students. To each question students answered "yes" or "no." These latter two scales were used to verify that the conditions had been successfully implemented.

Analyses

A 2x2 ANOVA was used to analyze differences between the two conditions and between the majority and minority students participating in the study. T-tests were used to analyze differences between the two conditions or between the minority and majority students in the cooperative condition.

Experimental Check

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

Results

From Table 1 it may be seen that the students in the cooperative condition achieved at a higher level than did the students in the individualistic condition, $F(1,44) = 3.69$, $p < .10$, and that the nonhandicapped students achieved at a higher level than did the handicapped students, $F(1,44) = 28.97$, $p < .001$. The lower achievement of the handicapped students confirms that the study meets the requirements for testing the theories concerning the impact of cooperative experiences with lower achieving students.

Insert Table 1 About Here

Interpersonal attraction between handicapped and nonhandicapped students was measured by the interaction between handicapped and nonhandicapped students during free-time and the social-schema, figure-placement task. There were two measures of cross-handicap free-time interaction. From Table 1 it may be seen that more cooperative students played with cross-handicapped peers during post-instructional free-time than students in the individualistic condition, F(1,41) = 11.69, p < .01. The distance-density index indicates that more students were actually clustered together during classroom free-time in the cooperative than in the individualistic condition, F(1,18) = 6.40, p < .05. Finally more nonhandicapped students were placed as engaging in an activity with handicapped students during free time in the cooperative than in the individualistic condition, F(1,41) = 3.85, p < .10. In the cooperative condition, the handicapped students placed more nonhandicapped classmates with handicapped peers than did handicapped students in the individualistic condition, while there was no such difference among the nonhandicapped students, F(1,41) = 2.95, p < .10. From Table 1 it may also be seen that there was more perceived cross-handicap giving, F(1,44) = 22.65, p < .001, and receiving, F(1,44) = 5.71, P < .05, of help in the cooperative than in the individualistic condition. In the cooperative condition there were 44 nominations for giving and 36 for receiving cross-handicap help, while in the individualistic condition only 8 and 9 such nominations were made. Students in the cooperative condition perceived more cooperative behavior, F(1,44) = 43.29, p < .001, than did the students in the individualistic condition. In the individualistic condition handicapped students perceived their classmates as being more cooperative than did the nonhandicapped students, while there was no difference in the cooperative condition, F(1,43) = 6.23, p < .05, while the handicapped students in the cooperative condition perceived more individualistic behavior occurring than did the nonhandicapped students, while there was no difference in the individualistic condition, F(1,44) = 2.93, p < .10.

In order to determine how majority and minority students actually interacted with each other within instructional situations they were directly observed. The results appear in Tables 2 and 3. There is considerable more cross-handicap interaction in the cooperative than in the individualistic condition for every category of interaction. This is true for both nonhandicapped-to-handicapped interaction and handicapped-to-nonhandicapped interaction. It may also be seen that when nonhandicapped-to-handicapped interaction is compared with nonhandicapped-to-nonhandicapped interaction in the cooperative condition (see Table 3), there were more miscellaneous statements made to nonhandicapped peers $\underline{t}(17) = 3.10$, $\underline{p} < .01$, slightly more agreements made to nonhandicapped peers, $\underline{t}(17) = 1.86$, $\underline{p} < .10$, and slightly fewer leads made to nonhandicapped peers, $\underline{t}(17) = 1.96$, $\underline{p} < .10$. When nonhandicapped-to-handicapped interaction is compared with handicapped-to-nonhandicapped interaction in the cooperative condition, it may be seen from Table 3 that the nonhandicapped initiated more leads, $\underline{t}(22) = 2.79$, $\underline{p} < .01$, and more informs, $\underline{t}(22) = 2.26$, $\underline{p} < .05$, toward their handicapped peers than vice versa. Handicapped students in the cooperative condition made more task-oriented miscellaneous remarks to their nonhandicapped peers than vice versa, $\underline{t}(22) = 2.29$, $\underline{p} < .05$.

Insert Tables 2 and 3 About Here

Discussion

The results of this study have implications for both the refinement of theory and for the practice of mainstreaming. Theoretically, contact theory,

cooperation theory, frustration-aggression theory, and academic-learning-time theory all predict that when lower-achieving handicapped students work cooperatively with nonhandicapped peers, they will be disliked. The active-encouragement position hypothesizes that efforts to achieve a group's goal will promote mutual active involvement in task activities and mutual regulation and support of each other's task efforts, which in turn will lead to liking among collaborators regardless of ability differences. To support the active-encouragement position two findings are needed: (1) that handicapped students in the cooperative condition like their handicapped peers better than do the nonhandicapped students in the individualistic condition, and (2) that the nonhandicapped and handicapped students in the cooperative condition do in fact interact with each other while demonstrating mutual active involvement in completing the assigned tasks and providing mutual regulation, support, and feedback on each other's task efforts.
individualistic condition, and (2) that the nonhandicapped and handicapped students in the cooperative condition do in fact interact with each other while demonstrating mutual active involvement in completing the assigned tasks and providing mutual regulation, support, and feedback on each others' task efforts.

There is evidence that the handicapped students clearly achieved at a lower level than did the nonhandicapped students. A true test of the differing theoretical positions, therefore, is possible. All three behavioral measures of interpersonal attraction between nonhandicapped and handicapped students (free-time interaction, distance-density, and social-schema) indicate that nonhandicapped students in the cooperative condition liked their handicapped peers more than did the nonhandicapped students in the individualistic condition. In the cooperative condition, 39 percent of the cross-handicap interaction was peer regulation, feedback, and support for task efforts, 48 percent involved asking task-related questions and providing task-related information, 4 percent were negative statements, 2 percent were off-task statements, and 7 percent were miscellaneous statements. These results indicate that the cross-handicap interactions that took place within the cooperative learning groups was task-related and supportive.

The increased interpersonal attraction between handicapped and nonhandicapped students in the cooperative condition and the evidence concerning the task oriented and supportive nature of their interaction provides support for the active-encouragement position. These results cast doubt that equal status in terms of achievement level is necessary for positive cross-handicap relationships to form. Contact theory may need to be revised to take these findings into account. Expectation-states theory, furthermore, is based on evidence that higher achieving students dominate the conversation within cooperative learning groups and talk mostly to each other rather than to lower-achieving members (Cohen, 1975, 1980). There is no such evidence of unequal status behavior in this study. Nonhandicapped students talked to their handicapped peers as frequently as they did to their nonhandicapped peers in almost all categories. Handicapped students were more active than nonhandicapped students in several categories of cross-handicap interaction. Expectation-states theory may have to be modified to take these findings into account. In his theorizing on cooperation, Deutsch (1949, 1962) argues that "bunglers" within cooperative groups will be disliked because they interfere with the accomplishment of the group's goals. His position is not supported by this study. There is no evidence in this study, furthermore, that working with lower-achieving handicapped students was frustrating to the nonhandicapped students in the cooperative condition. Finally, there was clearly no more off-task behavior resulting from having nonhandicapped and handicapped students collaborating with each other.

There has been considerable concern on the part of many educators and psychologists that when nonhandicapped and handicapped students are placed in the same learning groups, considerable coercive influence attempts will be made by the nonhandicapped students to force the handicapped students to achieve at a higher level. Tjosvold (1978), however, has noted that a cooperative context tends to promote supportive rather than coercive influence attempts. The results of this study indicate that within cooperative learning groups there will be very little negative interaction between nonhandicapped and handicapped students (less than 5 percent of the total cross-handicap interaction) and that the influence attempts that take place tend to be supportive, encouraging, and positive.

The results of this study corroborate the previous research indicating that cooperative learning experiences result in higher achievement than does individualistic ones (Johnson, Maruyama, Johnson, Nelson, and Skon, 1981), and indicate that the achievement of handicapped students will be promoted in classrooms that emphasize cooperative learning experiences involving collaboration between nonhandicapped and handicapped students.

This study's results are all the stronger due to the random assignment of students to conditions, the use of highly trained teachers to conduct the instruction, the rotation of teachers across conditions, the specific operationalizations of the cooperative and individualistic conditions, and the behavioral nature of the dependent variables.

Mainstreaming is required by law (PL94-142) and is being implemented throughout North America. In many classrooms, however, mainstreaming is being conducted in a highly individualistic way. Students work on their own, on individualized materials, and with a minimum of interaction with their classmates. The results of this study provide some indication that cooperative learning procedures should be utilized in mainstreamed classrooms.

REFERENCE NOTES

1. Johnson, D. W., Johnson, R. T., and Maruyama, G. Interdependence and interpersonal attraction among heterogeneous and homogeneous individuals: A theoretical formulation and a meta-analysis of the research. Submitted for publication, 1982.
2. Zaidman, Brian. The distance-density index. University of Minnesota, Cooperative Learning Projects, Technical Report, 1980.
3. Talmage, H., and Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle, Office of Evaluation Research, Technical Report 131, August, 1980.

REFERENCES

Allport, G. The nature of prejudice. Cambridge, MA: Addison-Wesley, 1954.

Cohen, E. The effects of desegregation on race relations. Law and Contemporary Problems, 1975, 39, 271-299.

Cohen, E. Design and redesign of the desegregated school: Problem of status, power, and conflict. In W. Stephen and J. Fengin (Eds.), Desegregation: Past, present, and future. New York: Pelenum Press, 1980.

Cook, S. Motives in a conceptual analysis of attitude-related behavior. In W. Arnold and D. Levine (Eds.), Nebraska symposium on motivation. Lincoln, NE: University of Nebraska Press, 1969.

Denham, C., & Lieberman, A. (Eds.) Time to learn. Washington, D.C., U.S. Department of Education, 1980.

Deutsch, M. An experimental study of the effects of cooperation and competition upon group process. Human Relations, 1949, 2, 199-232.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. R. Jones (Ed.), Nebraska symposium on motivation. Lincoln, NE: University of Nebraska Press, 1962, 275-319.

Johnson, D. W., & Johnson, S. The effects of attitude similarity, expectations of goal facilitation, and actual goal facilitation on interpersonal attraction. Journal of Experimental Social Psychology, 1972, 8, 197-206.

Johnson, D. W., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. The effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. Psychological Bulletin, 1981, 89, 47-62.

Tjosvold, D. Alternative organizations for schools and classrooms. In D. Bar-Tal and L. Saxe (Eds.), Social psychology of education. Washington, D.C.: Hemisphere, 1978, 275-298.

Tjosvold, D., Johnson, D. W., & Johnson, R. T. Effect of partner's effort and ability on liking for partner after failure on a cooperative task. The Journal of Psychology, 1981, 109, 147-152.

Watson, G. Action for unity. New York: Harper, 1947.

Table 1

Mean Responses on Measures of Achievement and Cross-Handicap Attraction

	Cooperative		Individualistic		
	Nonhand.	Hand.	Nonhand.	Hand.	F-Values
Achievement	42.800	27.667	37.824	21.400	C-I: 3.68* N-H: 28.97***
Free-Time Interaction	.240	.813	.175	.411	C-I: 3.89* 11.69***
Distance-Density Index	29.082	34.628	25.852	22.562	C-I: 6.40**
Social-Schema Task	6.333	7.833	6.111	4.500	C-I: 3.85* Int: 2.95*
Cross-Handicap Giving Help[a]	.204	.204	.046	.028	C-I: 22.65****
Cross-Handicap Receiving Help[a]	.157	.176	.065	.019	C-I: 5.71**
Cooperation Scale	7.278	7.167	4.529	5.667	C-I: 72.19**** N-H: 4.21** Int: 6.23**
Individualistic Scale	4.944	5.833	7.500	7.333	C-I: 43.29**** Int: 2.93*

*p < .10; **p < .05; ***p < .01; ****p < .001

Note: Nonhand. = Nonhandicapped; Hand. = Handicapped; the higher the mean, the more positive the response.

[a] Number of cross-handicap nominations, divided by the number of students from the other handicapped group in the condition.

Table 2

Mean Interaction Per Minute

	Nonhandicapped Talks To Handicapped			Handicapped Talks To Nonhandicapped		
	Coopera.	Individ.	t-Value	Coopera.	Individ.	t-Value
Leads	.253	.005	6.95****	.222	.005	2.79**
Supports	.010	.000	1.57	.012	.000	1.35
Agrees	.032	.001	4.69****	.106	.003	5.04****
Disagrees	.029	.000	3.24***	.078	.000	3.07**
Questions	.105	.004	4.28****	.249	.013	3.67***
Informs	.249	.002	7.57****	.352	.003	6.12****
Negatives	.017	.000	2.81***	.090	.003	2.42**
Off-Task	.010	.004	.94	.047	.005	1.22
Miscellaneous	.021	.004	3.91****	.126	.008	3.42***

*p < .10; **p < .05; ***p < .01; ****p < .001

Note: Coopera. = Cooperative; Individ. = Individualistic

Table 3

Comparison of Handicapped and Nonhandicapped Interaction Per Minute in the Cooperative Condition

	NH-H	NH-NH[a]	t-Value	NH-H	H-NH[a]	t-Value
Leads	.253	.203	1.96*	.253	.074	2.79***
Supports	.010	.009	.17	.010	.004	.52
Agrees	.032	.046	1.86*	.032	.035	.30
Disagrees	.029	.026	.22	.029	.026	.16
Questions	.105	.128	1.32	.105	.083	.52
Informs	.249	.215	.92	.249	.117	2.26**
Negatives	.017	.015	.46	.017	.030	1.04
Off-Task	.010	.009	.09	.010	.016	.64
Miscellaneous	.021	.049	3.10***	.021	.042	2.29**

*p .10; **p .05; ***p .01

Note: NH = Nonhandicapped; H = Handicapped.

[a] Adjusted for number of nonhandicapped

Analysis Of Verbal Interaction In Cooperative And Individualistic Learning Situations

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Running Head: Verbal Interaction

Abstract

The effects of cooperative and individualistic learning experiences on the social interaction and the verbal cognitive processes that may mediate or moderate the relationship between instruction and achievement were compared. Three levels of verbal rehearsal, peer academic regulation and feedback, and active involvement in learning were measured while students worked in cooperative learning groups or studied individualistically. Forty-eight fourth-grade students were assigned to conditions on a stratefied random basis controlling for ability and sex. They participated in the study for 55 minutes a day for 15 instructional days. The results indicate that cooperative learning experiences, compared with individualistic ones, promoted higher achievement, greater and higher level verbal rehearsal, greater peer regulation and feedback, and more active involvement in learning. Within the cooperative condition, verbal rehearsal, peer regulation, and active involvement in learning were significantly correlated with achievement. Low and medium ability students especially benefited from cooperative learning experiences.

Analysis of Verbal Interaction in Cooperative and Individualistic Learning Situations

There is considerable evidence that cooperative learning situations, compared with competitive and individualistic ones, promote higher achievement on almost all tasks and for all subject areas and age levels studied (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981); the average student working within a cooperative situation achieves at about the 80 percentile of the students working within a competitive or individualistic situation. Despite the large number of studies comparing the relative impact of cooperative, competitive, and individualistic learning situations on achievement, however, the processes that mediate or moderate the relationship between cooperation and productivity have yet to be clarified and consistently demonstrated. The purpose of this article is to explore the social interaction and cognitive processes that may mediate or moderate the relationship between cooperation and achievement.

A cooperative learning situation is one where a student can achieve his or her goal if and only if the other students with whom he or she is cooperatively linked achieve their goals (Deutsch, 1962). Cooperation is often contrasted with individualistic learning, where students' goal achievements are unrelated to each other and when one student achieves his or her goal, the goal attainment of the other students is unaffected. The social interaction and cognitive processes that may mediate or moderate the relationship between cooperation and achievement are: cognitive rehearsal; peer regulation, feedback, assistance, and encouragement; and active involvement in learning.

The verbal interaction patterns among cooperators that may mediate or moderate the relationship between cooperative experiences and achievement include (a) the oral rehearsal of the information being learned, (b) peer regulation of each other's task efforts and the task-related feedback and encouragement they provide one another, and (c) active involvement in learning. One of the most promising variables identified by Johnson and his associates (1981) that may mediate the relationship between cooperation and achievement is the verbal rehearsal of the information being learned. There is evidence that the rehearsal of information is necessary for the storage of that information into memory (Klatzky, 1975), and that elaborative rehearsal is more likely to promote long-term retention of information than is simple repetition (Criak & Lockhart, 1972; Elmes & Bjork, 1975; Evans, 1977; Geiselmen & Bjork, 1980; Owings & Baumeister, 1979; Ross & DiVesta, 1976). Discrimination studies indicate that vocalized stimuli (Carmean & Weir, 1967; DiVesta & Richards, 1971, Weir & Helgoe, 1968) and problem-solving studies indicate that vocalizing during practice of a problem-solving task produces higher performance than does not vocalizing (Davis, 1968; Gayne & Smith, 1962). Recent studies on the internal dynamics of learning groups indicate that elaborative rehearsal of information is positively related to achievement (Peterson & Janicki, 1979; Peterson, Janicki, & Swing, 1981; Webb, 1980). On the basis of this evidence it may be hypothesized that one process promoting higher achievement in cooperative than in individualistic conditions is the greater verbal rehearsal of information required by group discussion. There are three levels of verbal rehearsal that may be related to achievement: Low level rehearsal or repetition of information, intermediate level rehearsal or the stating of new information, and high level reharsal or the stating of explanations, elaborations of information, rationales, and ways the information relates to previously learned information.

A number of studies have found more peer academic regulation, feedback, support, and encouragement in cooperative than in individualistic learning situations (Johnson, 1980). Academic regulation, feedback, support, and encouragement by peers has been found to relate to task engagement (Filby, Note 1), but has not been directly associated with achievement. In a related pair of studies, Wertsch (1978, 1979) found that less mature learners, compared to more mature learners, need an external agent to provide more guidance and monitoring of their progress through the steps required to complete a task, indicating that low-ability students may especially benefit from peer encouragement and regulation. It may be hypothesized, therefore, that students (especially low-ability students) may achieve higher in cooperative than in individualistic learning situations due to the greater academic regulation, feedback, support, and encouragement they receive from their peers.

Active student involvement in a task has been demonstrated to be related to achievement (Wittrock, 1981). Within a cooperative learning situation, where students are required to discuss the material being learned with one another, there may be more active involvement than in individualistic learning situations where students are working on learning tasks quietly and by themselves. It may be hypothesized, therefore, that students in cooperative learning situations will achieve higher than will students in individualistic learning situations due to their more active involvement in the learning tasks.

All but a few of the studies comparing the relative achievement of cooperative, competitive, individualistic, and "traditional" learning situations have ignored the internal processes of each learning situation. There are available almost no observation systems for examining the interaction among students in cooperative learning groups. In this study two observation instruments were developed and used. Their validation provides interested researchers with needed tools to examine systematically and in theoretically relevant ways the verbal interaction patterns that may characterize effective collaboration.

Method

Sample

Subjects were 48 fourth-grade students from two different classrooms from a large inner-city elementary school in a midwestern metropolitan area school district. The sample consisted of 27 females and 21 males. There were 13 females and 11 males in the cooperative condition and 14 females and 10 males in the individualistic condition. There were 6 high ability, 11 medium ability, and 7 low ability students in each condition. There were 10 minority and 6 handicapped students in each condition. Finally, there were 12 middle class and 12 lower class students in each condition. All students were assigned randomly to the two conditions stratifying for sex, ability, ethnic membership, social class, and handicap.

Independent Variables

The two independent variables are: (1) cooperative and individualistic learning situations and (2) achievement level of students. In the cooperative condition students were instructed to work together as a group, completing one set of papers as a group while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in six groups of four students each on a stratified random basis, ensuring that the groups were relatively balanced for sex, ability, ethnic membership, social class membership, and with one handicapped student in each group. In the individualistic condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually. Students were observed in clusters of four which were also randomly formed to ensure a relative balance for sex, ability, ethnic membership, social class, and handicap.

The ability level of students was defined on the basis of their reading scores on their fourth-grade Scholastic Aptitude Test. Students with scores of 48 to 78 were considered high ability, students with scores of 20 to 39 were considered medium ability, and students with scores of 10 to 19 were considered low scoring students.

Procedure

Students in each condition were together for 55 mintues for 15 instructional days. Each condition was assigned a separate classroom comparable in size. The curriculum unit used for instruction was a social studies unit on the Boundary Waters Canoe Area of Minnesota. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. Both teachers followed a daily script detailing what they were to say and do each day.

Research Personnel

Two teachers participated in the study. Both teachers were highly experienced in conducting cooperative and individualistic lessons and had received over 90 hours of training in how to structure the two conditions. Both were certified teachers. To control for possible teacher effects, the teachers exchanged conditions at the midpoint of the study. Both teachers, therefore, spent an approximately equal amount of instruction time in each condition (7 days in one condition, 8 days in the other).

Four research assistants observed student verbal interaction on a daily basis in both conditions. Each observer received 25 hours of training on the observation instruments. There were at least two observers in each condition each day. Observers rotated conditions so that they observed each condition an equal number of times. The research assistants observed a group for three minutes and then took five minutes to prepare for the next observation. They conducted interrater reliability checks during the classroom observation sessions. Interrater reliability was over 85 percent for both observation instruments (using the Harris and Lahey (1978) method for combining and weighting occurrence and nonoccurrence of agreement).

Dependent Variables

There are four dependent variables in this study: achievement, verbal rehearsal, peer regulation and encouragement, and active involvement in learning. The achievement measure consisted of three tests, given after five, ten, and fifteen days of instruction. The tests contained 10, 17, and 24 objective questions respectively. The test items basically measured factual recall of the material studied. The tests were constructed by the research staff and the teachers involved in the study. Since the results of all three tests were congruent they were added together to make one achievement score.

The verbal rehearsal measure (Lyons, Note 2) consisted of the observation of three levels of verbal cognitive rehearsal of information: (1) low level rehearsal reflected in the repetition of information, (2) intermediate level rehearsal reflected in giving new information, and (3) high level rehearsal reflected in explanations, elaborations, providing rationale, and relating information to previously learned information.

The peer regulation, feedback, support, and encouragement measure consisted of the observation of: (1) leading statements such as directives and suggestions that are aimed at influencing or controlling the task behavior of a peer (verbal imperatives, verbal instructions, and response demanding were all included in this measure); (2) peer encouragement and acceptance aimed at encouraging and supporting the task activity of a peer; and (3) peer feedback consisting of agree statements (where a student agreed with or confirmed the opinion, answer, or conclusion of another student) and disagree statements (where a student disagreed with or disconfirmed the opinion, answer, or conclusion of another student).

The active involvement in learning measure consisted of the observation of: (1) task related questions, (2) providing task related information including the answer to a question, and (3) management of the group's task related efforts including directions and orders.

In addition to these observation categories, research assistants also recorded the frequency of: (1) social statements referring to personal feelings and sentiments, (2) negative statements that were hostile, rejecting, or ridiculing, (3) off-task statements, and (4) miscellaneous statements that did not fit into any other category.

In addition to the observation measures, a number of attitude scales were also given to the students participating in the study. Three of the attitude scales were developed by the authors and used in a number of previous studies. Students responded to each item on a five-point agree-disagree continuum. The peer-academic-support scale consisted of two items dealing with whether other students liked to help one learn and cared about how much one learned. The teacher-academic support scale consisted of three items dealing with whether the teacher liked to help one learn, cared about how much one learned, and liked to see one's work. The peer-helping scale consisted of three items dealing with how much the student liked being helped by his or her peers. Finally, two scales developed by Talmage and Waxman (1980) were given. The cooperation scale consisted of four questions dealing with working with other students and helping them learn. The individualistic scale consisted of four question dealing with working alone without interacting with other students. To each question students answered "yes" or "no." These latter two scales were used to verify that the conditions had been successfully implemented.

Analyses

T-tests were used to analyze differences between the two conditions, a 2x3 ANOVA was used to analyze differences among students of different ability levels within the two conditions, and Pearson's correlation procedure was used to determine the relationship between the two dependent variables. In order to partial out achievement level from the relationship between the two dependent variables, partial correlations were conducted.

Experimental Check

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

Results

The results are organized around three major questions: (1) Is there higher achievement in the cooperative than in the individualistic condition, (2) Are the interaction patterns in the two conditions significantly different, and (3) What is the relationship between the interaction patterns and achievement in the cooperative condition. While it is the latter question this study is most interested in, the first two questions have to be dealt with before a meaning ful answer to the third question can be found.

Achievement

From Table 1 it may be seen that the low and medium ability students in the cooperative condition achieved higher than did the low and medium ability students in the individualistic condition, $F(1,44) = 3.87$, $p < .06$. As expected, the high ability students achieved higher than did the medium and low ability students, and the medium ability students achieved higher than did the low ability students, $F(2,44) = 41.97$, $p < .01$.

Insert Table 1 About Here

Verbal Rehearsal and Group Maintenance Statements

The data in Table 2 indicate that far more low level rehearsal, $F(1,42) = 14.70$, $p < .01$, intermediate level rehearsal, $F(1,42) = 100.31$, $p < .01$, and high level rehearsal, $F(1,42) = 20.14$, $p < .01$, took place in the cooperative than in the individualistic condition. The high and medium ability students engaged in more intermediate level rehearsal than did the low ability students, $F(2,42) = 4.36$, $p < .05$. There was a significant interaction between ability level and conditions for intermediate level rehearsal, $F(2,42) = 9.60$, $p < .01$, and high level rehearsal, $F(2,42) = 4.16$, $p < .05$. In the cooperative condition the high ability students engaged in the most intermediate and high level of rehearsal, while in the individualistic condition they engaged in the least.

Also included in Table 2 are the correlations between the verbal rehearsal and group maintenance statements and achievement in the cooperative condition. The results indicate that when the ability level of the students was controlled for, the intermediate level of cognitive processing, $r(24) = .40$, $p < .05$, was significantly related to achievement.

From Table 3 it may be seen that almost all rehearsal and group maintenance statements in the cooperative condition were directed at peers, while the majority of such statements in the individualistic condition were directed towards onself or the teacher.

Insert Tables 2 and 3 About Here

Peer Regulation and Feedback

From Table 4 it may be seen that students in the cooperative, compared with the individualistic, condition, stated more leads, $F(1,42) = 98.38$, $p < .001$, more supports, $F(1,42) = 9.02$, $p < .01$, more agrees, $F(1,42) = 76.04$, $p < .001$, and more disagrees, $F(1,42) = 52.60$, $p < .001$. High ability students engaged in more leads, $F(2,42) = 7.57$, $p < .01$, than did the middle or low, and the middle ability students engaged in more leads than did the low ability students. There was a significant interaction effect for leads, $F(2,42) = 7.39$, $p < .01$. Engaging in leads, $r(24) = .49$, $p < .05$, was significantly correlated with achievement in the cooperative condition when students' achievement levels were controlled for.

Insert Table 4 About Here

Active Involvement in Learning

The data in Table 4 indicate that students in the cooperative, compared with the individualistic, condition stated more questions, $F(1,42) = 42.89$, $p < .001$, and more informs, $F(1,42) = 220.03$, $p < .001$. High ability students did more questioning, $F(2,42) = 3.41$, $p < .05$, and more informing, $F(2,42) = 9.13$, $p < .001$, than did the middle or low ability students, and the middle ability students engaged in more informs that did the low ability students. There were significant interaction effects for questioning, $F(2,42) = 5.13$, $p < .01$, and informing, $F(2,42) = 14.46$, $p < .001$; in the individualistic condition, low ability students engaged in more questioning and informing than did the high or medium ability students (a function of teacher help), while

Informing, $\underline{r}(24) = .45$, $\underline{p} < .05$, was significantly correlated with achievement in the cooperative condition when students' achievement levels were controlled for. Finally, from Table 2 it may be seen that there were more group management statements in the cooperative than in the individualistic condition, $\underline{F}(1,42) = 33.43$, $\underline{p} < .01$.

Other Verbal Interactions

From Table 2 it may be seen that there were more social statements in the cooperative than in the individualistic condition, $\underline{F}(1,42) = 47.69$, $\underline{p} < .001$. From Table 4 it may be seen that there were more miscellaneous, $\underline{F}(1,42) = 20.80$, $\underline{p} < .001$, and more negative, $\underline{F}(1,42) = 12.47$, $\underline{p} < .001$, statements in the cooperative than in the individualistic condition. When students' achievement levels were controlled for, negative statements, $\underline{r}(24) = -.58$, $\underline{p} < .001$, were negatively correlated with achievement in the cooperative condition.

From Table 4 it may also be seen that students in the cooperative condition engaged in more talking than did the students in the individualistic condition, $\underline{F}(1,42) = 194.81$, $\underline{p} < .001$, that overall the high ability students made more statements than did the middle or low ability students, $\underline{F}(2,42) = 5.52$. $\underline{p} < .01$, but that this was only true in the cooperative condition, $\underline{F}(2,42) = 9.20$, $\underline{p} < .001$; in the individualistic condition the low ability students engaged in more talking than did the high or middle ability students. Talking was significantly related to achievement in the cooperative condition, $\underline{r}(24) = .67$, $\underline{p} < .001$.

Attitude Scales

From Table 5 it may be seen that students in the cooperative condition compared with students in the individualistic condition, perceived more peer academic support, $\underline{F}(1,42) = 3.41$, $\underline{p} < .10$, more teacher academic support, $\underline{F}(1,42) = 5.01$, $\underline{p} < .05$, and more help given to them by peers, $\underline{F}(1,42) = 5.69$, $\underline{p} < .05$. Low ability students perceived more teacher academic support, $\underline{F}(2,42) = 5.88$, $\underline{p} < .01$, and more help received from peers, $\underline{F}(2,42) = 3.46$, $\underline{p} < .05$, due primarily to the responses of the high ability students in the individualistic condition. Finally, students in the cooperative condition perceived their class to be more cooperative, $\underline{F}(1,42) = 61.73$, $\underline{p} < .001$, and less individualistic, $\underline{F}(1,42) = 57.36$, $\underline{p} < .001$, than did the students in the individualistic condition.

Insert Table 5 About Here

Discussion

Although there is considerable evidence that cooperative learning experiences promote higher achievement than do individualistic or competitive ones (for the low and medium ability students, the results of this study tend to corroborate this finding), the social interaction and cognitive processes that may mediate or moderate the relationship between cooperation and achievement have not been fully explicated or examined in the previous research. The purpose of this study was to investigate the differences in verbalizations in cooperative and individualistic learning situations and examine their relationships to achievement in the cooperative condition.

The first type of verbalization examined was the oral rehearsal of the information being learned. Three levels of rehearsal were observed: low-level, or repetition of information; intermediate-level, or giving new information; and high-level, or explanations, elaborations, providing rationale, or relating new and previously learned information. The results of this study indicate that in the cooperative condition low, medium, and high ability students engaged in considerable more low-, intermediate-, and high-level rehearsal than did their counterparts in the individualistic condition. Within the cooperative condition low-level and high-level rehearsal were not significantly related to achievement, while intermediate-level rehearsal of the information being learned was. In other words, simply repeating the content without any indication of effort to organize, clarify, or interpret the content does not seem to promote mastery and retention of the material being learned. When students strive to obtain more facts and information about the content (intermediate-level rehearsal) then mastery and retention of the material is facilitated.

Since it was the low and medium ability students who seemed to benefit more from the cooperative learning procedures in terms of achievement, it is of interest as the nature of their verbal interaction with other group members. The intermediate and higher levels of verbal rehearsal were dominated by the high ability students, and engaged in least by the low ability students. But what intermediate and high levels of oral rehearsal the low and medium ability students did do seems to have had considerable benefit for them. These findings contrast with the findings of Peterson, Janicki, and Swing (1981) and Webb (1980) who found a curvilinear relationship between participation and ability showing depressed participation among medium ability students in heterogeneous learning groups, with the achievement of medium ability students suffering as a consequence. In this study medium ability students participated actively and their achievement benefited as a result.

While the results concerning rehearsal indicate that it is of considerable importance, it is certainly not the whole story, as other factors seemed to influence the achievement of high, medium, and low ability students in the cooperative condition. One such factor may be the enhanced peer regulation, feedback, support, and encouragement often found in cooperative learning situations (Johnson, 1980; Johnson & Johnson, 1975, 1978). The results of this study indicate that more peer encouragement, feedback and regulation were found in the cooperative than in the individualistic condition. Within the cooperative condition, peer academic regulation was significantly related to achievement, while peer feedback did not seem to be a powerful influence.

Deutsch's (1962) original theory of cooperation posited that an inherent component of cooperation is inducibility, where one is open to influence from fellow cooperators. There has been speculation that when high and medium ability students are placed in cooperative learning groups with low ability students, coercive methods of influence will be used to create more on-task behavior by the low achieving students. Tjosvold (1978), however, has noted that a cooperative context tends to promote supportive rather than coercive influence attempts. The results of this study found (a) little evidence of coercive influence attempts, as the percentage of negative statements in the cooperative condition was very low, and (b) considerable evidence for supportive influence attempts, as the percentage of support, encouragement, and praise for achievement and directions and suggestions given with positive affect were relatively high.

Another factor that may promote the higher achievement commonly found in cooperative learning situations is the active involvement in learning promoted by cooperative learning. The two major indices of active involvement in the learning task used in this study were the observation of frequency of asking task-related questions, providing task-related information including the answer to a question, and management of the group's task-related efforts. The results of this study indicate that more of all these activities occur in cooperative than in individualistic learning situations. The active engagement of providing task-related information was found to be highly correlated with achievement in the cooperative condition. These results corroborate the previous findings by Wittrock (1981) and indicate that verbal involvement may have considerable importance for achievement. Educators who wish to promote high student achievement may wish to encourage students to provide task-related information for each other.

It is of importance that the present study found no difference between the cooperative and individualistic conditions on student time-on-task. While time-on-task has been promoted as an important influence on achievement, the results of this study indicate that different levels of achievement may be obtained by different types of task activity. In the individualistic learning condition students read material and filled out worksheets. They were instructed to do this silently. In the cooperative condition students read and discussed material and spent less time filling out worksheets. The type of cognitive processing involved in these two different types of task activities may not be fully observed (as students in the individualistic condition may be engaging in nonoral rehearsal), but the results of this study indicate that oral rehearsal of information, the active regulation and encouragement of peer's achievement, and the active verbal involvement in learning are all important aspects of increasing the achievement of low and medium ability students. Thus, it may not be the actual time-on-task that may be important for achievement, but rather the type of cognitive processing and task engagement that students are involved in while they work on the task.

There is currently considerable concern among educators and psychologists concerning the achievement of high-ability students. One alternative often suggested to ensure high achievement by high-ability students is to separate them from medium- and low-ability students to allow the high-ability students to work as fast as they can by themselves. The results of this study indicate that in highly individualistic learning situations the high-ability students engage in less intermediate and high level oral rehearsal than do medium- and low-ability students and make fewer task-related verbal statements than do the low-ability students, while the opposite is true in the cooperative condition. The high-ability students in the individualistic condition, furthermore, perceived less academic support and assistance from peers and the teacher than did the medium- and low-ability students, while there was no difference among students from different ability levels in the cooperative condition. The achievement results of this study, furthermore, indicate that the high-ability students' achievement did not suffer by working with medium- and low-ability peers, and other studies have found achievement gains (compared with individualistic and competitive instruction) for high-ability students resulting from learning within heterogeneous cooperative groups (Johnson, Skon, & Johnson, 1980; Smith, Johnson, & Johnson, 1982). It may be more beneficial, therefore, to place high-ability students in heterogeneous cooperative learning groups than in individualistic learning situations where they may feel isolated and non-supported academically.

The results of this study indicate that there was considerable more verbal interaction in the cooperative than in the individualistic condition and that while student-student interaction dominated in the cooperative condition, verbal statements aimed at oneself or the teacher dominated in the individualistic condition. These results are not surprising since students were encouraged to interact with each other in the cooperative condition, and were encouraged not to interact with their peers, but rather seek help and assistance from the teacher in the individualistic condition. Unexpected findings were the amount of talking to oneself observed in the individualistic condition and the absence of interaction with the teacher in the cooperative condition.

Finally, the results of this study indicate that social statements were not related to achievement and that negative and miscellaneous statements were moderately negatively (but not significantly for this sample size) related to achievement. These results should be pursued further in future studies with larger samples.

Reference Notes

1. Filby, N. How teachers promote "academic learning time": Instructional variables related to student engagement. Paper presented at the American Educational Research Association Convention, Toronto, March, 1978.
2. Lyons, V. Analysis of cognitive processes in cooperative learning groups. Ph.D. Dissertation, University of Minnesota, 1982.

References

Carmean, S. & Weir, M. Effects of verbalizations of discrimination learning and retention. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 545-550.

Craik, R., & Lockhart, R. Levels of processing: A framework for memory research. Journal of Verbal Learning and Verbal Behavior, 1972, 11, 671-684.

Davis, J. Verbalization, experimenter presence, and problem solving. Journal of Personality and Social Psychology, 1968, 8, 299-302.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), Nebraska symposium on motivation. Lincoln, NE: University of Nebraska Press, 1962, 275-320.

DiVesta, F., & Rickards, J. Effects of labeling and articulation on the attainment of concrete, abstract, and number concepts. Journal of Experimental Psychology, 1971, 88, 41-49.

Elmes, E., & Bjork, R. The interaction of encoding and rehearsal processes in the recall of repeated and non-repeated items. Journal of Verbal Learning and Verbal Behavior, 1975, 14, 30-42.

Evans, J. On the inconstant effects of study instructions. American Journal of Psychology, 1977, 90, 511-516.

Gagne, R., & Smith, E. A study of the effects of verbalization on problem solving. Journal of Experimental Psychology, 1962, 63, 12-18.

Geiselman, R., & Bjork, R. Primary versus secondary rehearsal in imagined voices: Differential effects on recognition. Cognitive Psychology, 1980, 12, 188-205.

Harris, F., & Lakey, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. Behavior Research and Therapy, 1978, 11 523-526.

Johnson, D.W. Group processes: Influences of student-student interaction on school outcomes. In J. McMillan (Ed.), The social psychology of school learning. New York: Academic Press, 1980.

Johnson, D., and Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Johnson, D., & Johnson, R. (Eds.) Social interdependence in the classroom: Cooperation, competition, and individualism. Journal of Research and Development in Education, 1978, 12, Fall issue.

Johnson, D., Maruyama, G., Johnson, R., Nelson, D., and Skon, L. The effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. Psychological Bulletin, 1981, 89, 47-62.

Johnson, D., Skon, L., & Johnson, R. Effects of cooperative, competitive, and individualistic conditions on children's problem-solving performance. American Educational Research Journal, 1980, 17, 83-93.

Klatzky, R. Human memory structures and processes. San Francisco: W. H. Freeman & Company, 1975.

Owings, R., & Baumeister, A. Levels of processing, encoding strategies, and memory development. Journal of Experimental Child Psychology, 1979, 28, 100-118.

Peterson, P., & Janicki, T. Individual characteristics and children's learning in large-group and small-group approaches. Journal of Educational Psychology, 1979, 71, 677-687.

Peterson, P., Janicki, T., & Swing, S. Ability x treatment interaction effects on [illegible]ren's learning in large-group and small-group approaches. America[illegible]onal Research Journal, in press.

Ross, S., & DiVesta, F. Oral summary as a review strategy for enhancing recall of textual material. Journal of Educational Psychology, 1976, 68(6), 689-695.

Smith, K., Johnson, D., & Johnson, R. Effects of cooperative and individualistic instruction on the achievement of handicapped, regular, and gifted students. Journal of Social Psychology, 1982, 116, 277-283.

Talmage, H., & Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle, Office of Research, Technical Report #131, August, 1980.

Tjosvold, D. Alternative organizations for schools and classrooms. In D. Bar-Tal & L. Saxe (Eds.), Social psychology of education. Washington, D.C.: Hemisphere, 1978, 275-298.

Webb, N. A process-outcome analysis of learning in group and individual settings. Educational Psychologist, 1980, 15, 69-83.

Weir, M., & Helgoe, R. Vocalization during discrimination: Effects of a mixture of two types of verbalization patterns. Journal of Verbal Learning and Verbal Behavior, 1968, 7, 842-844.

Wertsch, J. Adult-child interaction and the roots of metacognition. Quarterly Newsletter of the Institute for Comparative Human Development, 1978, 1, 15-18.

Wertsch, J. From social interaction to higher psychological processes: A clarification and application of Vygotsky's theory. Human Development, 1979, 22, 1-22.

Wittrock, M. Learning and memory. In F. Farley and N. Gordon (Eds.), Psychology and education: The state of the union. Berkeley, CA: McCutchan Publishing Company, 1981.

Footnote

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Table 1

Mean Level of Achievement

	Cooperative	Individualistic	Contrast
High Ability	49.60	51.60	0.30
Medium Ability	39.44	33.27	2.86*
Low Ability	29.40	21.00	4.98**

* $p < .10$; ** $p < .05$

Table 2

Mean Responses Per Observation Interval for Verbal Rehearsal and Group Maintenance Observation Measures

	COOPERATIVE			INDIVIDUALISTIC					
	High (n=6)	Medium (n=11)	Low (n=7)	High (n=6)	Medium (n=11)	Low (n=7)	F	Correlation of Coop. & Ach.	Correlation of Coop. & Ach., Control. for Ability
Low level Rehearsal	1.167	.909	1.000	0	0	0	A) 14.70 ***	.19	.15
Intermediate Level Rehearsal	43.667	35.091	17.571	1.333	3.909	6.714	A) 100.31 *** B) 4.36 * C) 9.60 ***	.69 ***	.40 *
High Level Rehearsal	12.500	6.818	4.571	.333	3.727	1.143	A) 20.14 *** C) 4.16 *	.55 **	.09
TOTAL REHEARSAL	57.333	42.818	23.143	1.667	7.636	7.857	A) 95.92 *** B) 4.75 * C) 9.00 ***	.70 ***	.25
Social Statements	8.167	7.545	4.143	.333	.455	.286	A) 47.49 ***	- .02	- .36
Group MANAGEMENT	24.833	23.636	12.571	3.333	4.909		A) 33.43 ***	.30	.22
TOTAL MAINTENANCE	33.000	31.182	16.714	3.667	5.364	6.714	A) 47.08 *** C) 3.31 *	.25	- .04

NOTE: * $p < .05$; ** $p < .01$; *** $p < .001$

A = Cooperative vs Individualistic; B = Achievement Level; C = Cooperative Individualistic x Achievement

Table 3

Percentage of Verbal Rehearsal and Group Maintenance Statements

	Cooperative	Individualistic
Others in Group	97.0%	15.0%
Teacher	1.6%	32.0%
Self	1.0%	49.0%
Other	.4%	4.0%

Table 4

Mean Responses Per Minute for Peer Regulation and Active Involvement Observation Measures

	COOPERATIVE			INDIVIDUALISTIC					
	High (n=6)	Medium (n=11)	Low (n=7)	High (n=6)	Medium (n=11)	Low (n=7)	F	Correlation of Coop. & Ach.	Correlation of Coop. & Ach., Control. for Ability
Leads	1.041	.739	.345	.031	.019	.025	A) 98.38 *** B) 7.57 ** C) 7.39 **	.73 ***	.49 *
Supports	.056	.020	.019	0	0	.004	A) 9.02 **	.41 *	.24
Agrees	.098	.131	.139	.005	.010	.004	A) 76.04 ***	.09	.30
Disagrees	.100	.097	.060	.005	.001	.005	A) 52.60 ***	.28	.08
Questions	.731	.385	.353	.094	.097	.171	A) 42.89 *** B) 3.41 * C) 5.13 *	.51 **	.23
Informs	1.343	1.018	.582	.059	.046	.137	A) 220.03 *** B) 9.13 *** C) 14.46	.80 ***	.45 *
Miscellaneous	.160	.211	.187	.048	.069	.072	A) 20.80 ***	-.26	-.31
Negatives	.080	.060	.078	.008	.005	.013	A) 12.47 ***	-.31	-.58 ***
Off Task	.087	.050	.041	.023	.033	.059		-.28	-.22
TOTAL TALKS	3.160	2.364	1.678	.267	.278	.456	A) 194.81 *** B) 5.52 ** C) 9.20 ***	.67 ***	.16

NOTE: * $p < .05$; ** $p < .01$; *** $p < .001$

A = Cooperative vs Individualistic; B = Achievement Level; C = Cooperative Individualistic x Achievement

Table 5

Mean Responses on Attitude Measures

	COOPERATIVE			INDIVIDUALISTIC				
	High (n=6)	Medium (n=11)	Low (n=7)	High (n=6)	Medium (n=11)	Low (n=7)	F	Correlation of Coop. & Ach.
Peer Academic Support	7.000	6.182	7.000	4.333	5.364	6.857	A) 3.41 *	.14
Teacher Academic Support	8.833	8.909	9.857	6.833	9.091	9.143	A) 5.01 ** B) 5.88 ***	.31
Help	7.833	8.000	8.714	5.667	7.273	8.143	A) 5.69 ** B) 3.46 **	.20
Cooperation	7.400	7.300	6.714	4.667	4.818	4.714	A) 91.028 ****	-.03
Individual.	4.400	4.636	4.571	7.167	6.818	6.571	A) 57.359 ****	-.25

NOTE: * $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$

A = Cooperative vs Individualistic; B = Achievement Level;

C = Cooperative Individualistic x Achievement

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Effect of Partner's Effort and Ability on Liking for Partner after Failure on a Cooperative Task[1]

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Running Head: Effort and Ability

Abstract

The effect of a partner's effort and ability on one's liking for the partner after failure on a cooperative task was examined. Fifty-two undergraduate students were randomly assigned to conditions. Subjects participated in a cooperative task in which a confederate (posing as a subject) demonstrated high or low ability and high or low effort. All subjects failed on the task due to the low-performance of the confederate. The results indicate that when future contact in work or social settings was assumed, high-effort partners were better liked than were low-effort partners. On a simple rating of liking, within the low-ability conditions the low-effort partner was liked better than was the high-effort partner, while the reverse was true in the high-ability conditions. This interaction effect was also found on a behavior measure of willingness to give up one's own rewards to increase the rewards of the partner.

Effect of Partner's Effort and Ability on Liking for Partner after Failure on a Cooperative Task

There is considerable evidence that cooperative experiences promote greater interpersonal attraction among participants than do competitive or individualistic experiences (Johnson & Johnson, 1975). Deutsch's (1962) theory explains such findings as resulting from goal facilitation and frustration. Deutsch postulates that when participants facilitate the achievement of each other's goals, interpersonal attraction will result, but when participants frustrate the achievement of each other's goals, negative attitudes toward each other will develop. On the basis of Deutsch's theory it would be predicted that when a group fails because of the low performance of one of it's members, the low-performing member will be disliked.

Johnson and Johnson (1972) modified Deutsch's theory somewhat by demonstrating that it is the expectation that other group members will facilitate one's goals, not the actual facilitation, that leads to interpersonal attraction. On the basis of these results, it would be predicted that a low performing member of a cooperative group would not be disliked as long as the other group members expected the low performing member to facilitate the group's goals. In the Johnson and Johnson (1972) study, however, it may be assumed that the low performing members were perceived as exerting some effort to contribute to the group's goal accomplishment. When a low performing member is perceived as not trying to help the group, the relationship between expected goal facilitation and interpersonal attraction may not hold.

The purpose of this study is to determine the impact of perceived effort and ability of a low performing group member on the other member's liking for the low-performing member. It is hypothesized that regardless of ability, high-effort low performing members will be better liked than will low-effort low performing group members. In measuring interpersonal attraction, however, it is necessary to use more than one type of measure. A simple measure of liking may be misleading when low-ability conditions are included in the study, as there is a tendency to sympathize with low ability people (Katz & Glass, 1979). A more accurate measure of interpersonal attraction may be questions dealing with the desirability of future interaction in task and social situations. Finally, a behavioral measure of liking may also be illuminating. In almost all of the previous research on cooperation and interpersonal attraction, only simple measures of liking have been used. All three types of measures of interpersonal attraction will be used in this study.

Method

Fifty-two undergraduates, recruited from courses at Simon Frazer University, volunteered to participate in the experiment. Subjects were randomly assigned to the four conditions, 13 in each condition. They were given one chance in a $35 lottery for their participation.

The procedure was as follows. A subject and a confederate (posing as a subject) were scheduled at each session. They were told that the experiment focused on group development, that there would be two tasks to complete, and that they could earn chances in a $35 lottery on the basis of their performance on the two tasks. Task 1 involved solving five math problems. On this task each problem worked correctly contributed one point to the joint score of the subject and the confederate and they could earn partial credit for a problem even if they did not arrive at the correct answer. A table indicated that with four or less points they would receive 0 chances in the lottery, with five points they would receive 1 chance, with six points they would receive 2 chances, and so forth. Each person was to work by him- or herself on the five math problems, but it was emphasized that each person's number of chances in the lottery was dependent on the joint productivity of the pair.

Before they began, the subject and the confederate were asked to practice on a problem similar to those they would work during the cooperative task. After they had finished the practice problem the experimenter collected their responses. In the high-ability conditions, the experimenter indicated that the confederate had gotten the right answer, asked the confederate to explain his or her reasoning, and congratulated the confederate on his or her ability. The confederate volunteered that he or she was from a family in which everyone had always been good at these types of problems. In the low-ability conditions, the experimenter indicated that the confederate would not receive even partial credit for his or her answer. The confederate volunteered that he or she had never been good at these types of problems and had great difficulty in lower level math courses.

The effort induction was carried out while the subject and the confederate were working on their problems. Confederates in the high-effort conditions worked consistently on the problems, making charts and tables on spare paper, pulling at their hair, and indicating persistence and concentration in nonverbal ways. They told the subjects that they (the confederates) were working hard on the problems. In the low-effort conditions, confederates soon appeared to weary of the task, doodled on spare paper, looked around the room, and rested their head on their hands. They told the subjects that they (the confederates) did not feel like working the problems.

After 15 minutes the experimenter collected the answers of the subject and the confederate and separated them into two different rooms. A few minutes later the subject was informed that he or she had gotten 3 points, but the confederate had received only 1 point, so each receive 0 chances in the lottery. They subject then completed a questionnaire on which they indicated their perceptions of and liking for the confederate.

The second task was then introduced. The Prisoner's Dilemma Game was explained. The subjects were informed that they could earn chances in the $35 lottery on the basis of how many points they earned as an individual on the PDG. They were informed that the task would have two rounds and that the confederate had been randomly selected to make his or her choice first. They were then told that the confederate had selected the "X" (cooperative) choice on the first round. If the subject choose the "cooperative" response, the confederate would earn 20 points and the subject would earn 20 points. If the subject choose the "competitive" response, the confederate would earn 5 points and the subject would earn 35 points. The subject made his or her choice, The subject was then informed that on the second round the confederate made the "X" (cooperative) choice. The subject then made his or her choice.

This ended the experiment. The subjects were debriefed, given 1 chance in the lottery, and thanked for their participation.

There were four dependent variables in this study: Choice of a future partner, desire to meet partner socially, liking for partner, and assistance in helping partner win chances in the lottery. Subjects were asked to indicate on a questionnaire whether they would like to work with the same or a different partner on a similar task in the future. They were asked to rate on 7-point scales the extent to which they wanted to meet their partners socially and the extent to which they liked their partner. As an *operations-check* subjects also rated on 7-point scales the ability and effort of their partners. The subjects then played a two-trial Prisoner's Dilemma Game in which they could assist their partner in gaining chances in the $35 lottery while losing chances for themselves or gain chances for themselves while eliminating their partner's chances.

The *confederates* were 3 male and 2 female undergraduates. They were trained to carry out the effort and ability inductions and to help the subjects understand the instructions and become involved in the experimental situation. The confederates participated in a pilot study to ensure that they were effective in carrying out their role. Confederates were assigned randomly to conditions.

Results

From Table 1 it may be seen that subjects in the high-ability conditions perceived their partners to have higher ability than did the subjects in the low-ability conditions, $F(1,48) = 14.19$, $p < .01$. Subjects in the high-effort conditions perceived their partners as exerting more effort than did the subjects in the low-effort conditions, $F(1,48) = 27.17$, $p < .01$. From these results it may be concluded that the operations worked.

There were two measures of interpersonal attraction for the low-performing partner that implied future contact. From Table 1 it may be seen that the confederates in the high-effort conditions were choosen as future partners more frequently than were the confederates in the low-effort conditions, $F(1,48) = 10.00$, $p < .01$. High-effort partners were also rated as more desirable social partners than were low-effort partners, $F(1,48) = 1.97$, $p < .17$, although not at an acceptable level of significance. There is also some evidence that high-ability confederates are rated as more desirable social partners than were low-ability confederates, $F(1,48) = 1.80$, $p < .19$.

From Table 1 it may also be seen that in the low-ability conditions, low-effort confederates were liked better than were high-effort confederates, while the opposite was true in the high-ability conditions, $F(1,48) = 2.67$, $p < .11$.

Finally, low-effort confederates received more cooperative choices from the subjects than did the high-effort confederates, $F(1,48) = 5.40$, $p < .05$, an effect that was much stronger in the low-ability conditions than in the high-ability conditions, $F(1,48) = 3.03$, $p < .10$.

Discussion

The results of this study indicate that after failure on a cooperative task, high-effort partners are liked better than are low-effort partners, regardless of their ability. These results hold for measures of interpersonal attraction that imply future contact in work and social settings.

In addition, this study's results indicate an ambivalence toward one's partner in low-ability/low-effort condition. After failure on a cooperative task, when one's partner is perceived as having low ability and as having exerted low effort, the partner is better liked (on a simple rating of liking) than is a low-ability, high-effort partner, is provided assistance in winning chances for a lottery even at the expense of giving up some of one's own chances, but is not seen as desirable for future contact in work and social settings. No such ambivalence exists in the high-ability conditions.

high-ability conditions. These results indicate that it may be important to differentiate between interpersonal attraction based on wanting to interact with the other person in the future (in work and/or social settings) and interpersonal attraction that either does not imply future interaction or is based on feelings of sympathy and charity.

On the basis of the results of this study and the previous research by Deutsch (1962) and Johnson and Johnson (1972), it may be hypothesized that cooperative experiences will result in interpersonal attraction among participants when: (a) participants facilitate the achievement of their joint goal, (b) participants expect each other to facilitate the achievement of their joint goal, and (c) low-performing participants are perceived as exerting effort to achieve the joint goal.

References

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), Nebraska symposium on motivation. Lincoln, Neb.: University of Nebraska Press, 1962, 275-320.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Johnson, D. W., & Johnson, S. The effects of attitude similarity, expectation of goal facilitation, and actual goal facilitation on interpersonal attraction. Journal of Experimental Social Psychology, 1972, 8, 197-206.

Katz, I., & Glass, D. An ambivalence-amplification theory of behavior toward the stigmatized. In W. Austin & S. Worchel (Eds.), The social psychology of intergroup relations. Monterey, Calif.: Brooks/Cole, 1979, 55-70.

Footnote

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Table 1

Mean Responses for Dependent Variables and Operations Checks

	Low Ability	Low Ability	High Ability	High Ability	
	Low Effort	High Effort	Low Effort	High Effort	F
Ability of Other	2.54	3.08	4.93	4.23	A: 14.19**
Effort of Other	2.92	5.92	3.64	5.85	E: 27.17**
Choice of Future Partner[a]	1.92	1.46	1.71	1.38	E: 10.00**
Desire to Meet Socially	3.85	4.31	4.29	5.08	E: 1.97 A: 1.80
Liking for Partner	4.77	4.31	4.43	4.92	ExA: 2.67
PD Choices[b]	2.00	1.23	1.46	1.38	E: 5.40** ExA: 3.03*

*$p < .10$; **$p < .05$; ***$p < .01$

[a] Same Partner = 1; Different Partner = 2

[b] The higher the mean, the more frequent cooperative choices.

Note: The higher the score, the more favorable the attitudes.

Integrating Severely Adaptively Handicapped Seventh-Grade Students into Constructive Relationships with Nonhandicapped Peers in Science Class

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Abstract

The effects of cooperative and individualistic learning experiences were compared on interaction and relationships between severely adaptively handicapped and nonhandicapped seventh-grade students in science classes. Two views were contrasted, one predicting that requiring cooperation between the two groups of students would result in increased rejection of the severely adaptively handicapped students and one predicting that cooperation would promote increased interpersonal attraction regardless of the heterogeneity of the students. Forty-eight suburban junior-high-school, middle class students (41 nonhandicapped and nine severely adaptively handicapped) were assigned to conditions on a stratified random basis controlling for handicap, sex, and ability level. They participated in the study for 40 minutes a day for 10 instructional days. The results indicate that cooperative learning procedures, compared with individualistic ones, promoted more interaction and interpersonal attraction between severely adaptively handicapped and nonhandicapped students.

Integrating Severely Adaptively Handicapped Seventh-Grade Students into Constructive Relationships with Nonhandicapped Peers in Science Class

Evidence is accumulating that mildly and moderately handicapped students are more successfully mainstreamed into regular classrooms when cooperative learning procedures are used than when "traditional," competitive, or individualistic learning procedures are implemented (Johnson, Johnson, & Maruyama, 1983). It is unclear, however, whether these findings may be generalized to the mainstreaming of more severely handicapped students. Proponents of cooperative learning often give the impression that any handicapped student may be successfully integrated into constructive relationships with nonhandicapped students in any academic area. Skeptics often note that there may be limits to what cooperative interaction may achieve, and hypothesize that requiring nonhandicapped students to collaborate with severely handicapped peers may be counterproductive. Neither advocates nor skeptics of cooperative learning have investigated the impact of mainstreaming severely handicapped students into cooperative learning groups within an academic class. By focusing on the mainstreaming of teenagers with severe adaptation problems, this study will do so.

A cooperative learning situation is one in which students can achieve their goals if, and only if, the other students with whom they are cooperatively linked achieve their goals (Deutsch, 1962). Cooperation is often contrasted with individualistic learning, in which students' goal attainments are unrelated to and independent from each other. When severely handicapped students are mainstreamed into cooperative and individualistic learning several overlapping questions may be raised.

The first question is whether being required to work collaboratively with severely handicapped peers will lower the achievement of nonhandicapped students. There is considerable evidence that cooperative learning, compared with "traditional," competitive, or individualistic instruction, will promote higher achievement on the part of high, medium, and low ability students (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981). But when severely handicapped students are placed in cooperative learning groups with nonhandicapped peers, the achievement of the nonhandicapped students may be disrupted.

The second question is whether being required to work collaboratively with nonhandicapped peers will result in withdrawal by the severely handicapped students. Severely handicapped students have fewer opportunities for social interaction and, therefore, their social skills may be less than optimal. Attempts to interact with nonhandicapped peers may be frustrating. There is some evidence that the more advanced readers dominate conversation in instructional groups (Cohen, 1975), which may be intimidating to severely handicapped students. For a variety of reasons, placing severely handicapped students in cooperative learning groups with nonhandicapped peers may result in the handicapped students withdrawing and not participating.

The third question is whether the nonhandicapped students in the cooperative learning groups will ostracize and ignore the severely handicapped members. A number of theoretical perspectives (Allport, 1954; Cohen, 1975; Deutsch, 1962) would predict that the effort involved in including severely handicapped students in a cooperative effort would result in the nonhandicapped students being frustrated and, therefore, isolating themselves from such interaction.

The final question is whether the nonhandicapped students will develop any liking for their severely handicapped groupmates. There is some evidence that including severely adaptively handicapped students in physical education activities such as bowling results in more interpersonal attraction between handicapped and nonhandicapped students when they are collaborating than when they are competing or participating individualistically (Johnson, Rynders, Johnson, Schmidt, & Haider, 1979; Rynders, Johnson, Johnson, & Schmidt, 1980). But there is also evidence that retarded students participating in junior high academic and nonacademic classes were not socially accepted by the nonretarded (Goodman, Gottlieb, & Harrison, 1972; Gottlieb & Budoff, 1973; Gottlieb, Cohen, & Goldstein, 1974; Gottlieb & Davis, 1973; Rucker, Howe, & Snyder, 1969). None of these classes, however, were structured cooperatively. There are no studies focusing on the effectiveness of cooperative learning activities in promoting interpersonal attraction between severely adaptively handicapped students and nonhandicapped peers within academic classes such as science.

The considerable amount of research that has been conducted on cooperative learning (Johnson & Johnson, 1975, 1978; Sharon, 1980) indicates that when severely adaptively handicapped students are mainstreamed into cooperative and individualistic learning situations they will be more accepted, interacted with, and liked in the cooperative situation. An equally strong case can be built, on the other hand, to indicate that requiring severely handicapped and nonhandicapped students to collaborate with each other will result in the students withdrawing from and avoiding each other, disliking each other, and disrupting the achievement of the nonhandicapped students. The purpose of this study is to contrast these contradictory predictions. It may also be noted that almost all of the mainstreaming studies that have been conducted have focused on elementary classrooms. There is very little evidence that mainstreaming, especially of severely handicapped students, can be successfully implemented at the secondary level. This study, therefore, focuses on seventh-grade science classes.

Finally, the mainstreaming of severely adaptively handicapped students is of interest for a number of developmental and educational reasons. Severely handicapped students typically have few opportunities for prolonged and task-oriented interaction with nonhandicapped peers, and their social and cognitive development may suffer as a result. Since socialization and development take place primarily through interpersonal interaction, the isolation of severely handicapped students has serious consequences. It is of considerable importance, therefore, to find ways of mainstreaming severely adaptively handicapped students so that considerable interaction with nonhandicapped peers takes place and constructive cross-handicap relationships result.

Method

Sample

Subjects were 48 suburban junior-high-school, middle-class students from a midwestern school district. The sample consisted of 28 male and 20 female seventh-grade students. Nine of these students were severely functionally handicapped. The most severely handicapped students in the school were chosen for this study. These students had not been mainstreamed for any academic subject but spent their school day in a self-contained, special education classroom for the severely functionally handicapped. Seven of the handicapped students had IQ's ranging from 55 to 71, one had an IQ of 80, and one was an autistic student whose IQ was untestable and who functioned at the level of a 3-year old. Students were randomly assigned to conditions, stratifying for handicap, ability level, and sex. Five of the severely functionally handicapped students (including the autistic student) were randomly assigned to the cooperative condition and four to the individualistic condition.

Independent Variables

The independent variable was cooperative versus individualistic learning situations. In the cooperative condition students were instructed to work together as a group, completing one set of papers as a group while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in six groups of four students each on a stratified random basis, ensuring that the groups were balanced for sex and ability and with one handicapped student in each group. In the individualistic condition students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually.

Procedure

Students in each condition were together for ten instructional days for 55 minutes per day. Each condition was assigned a separate classroom comparable in size. The curriculum unit used was a science unit on digestion and consisted of material the students had not covered previously in their regular science classes. Each day consisted of a lesson pertaining to the unit; lessons were designed to be completed each day. Each day the teachers would give a short lecture, explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. Teachers followed a daily script detailing what they were to say and do each day. Before the beginning of the instructional unit, three class sessions were spent in explaining the procedures to the students and ensuring that they understood how to behave in their condition. Strategies for interacting with the handicapped students were given to the nonhandicapped students in both conditions during these three preinstruction sessions.

Research Personnel

Four teachers participated in the study. Two of the teachers worked full-time in the junior high where the study was conducted. One was a science teacher and one was a special education teacher. Two other teachers highly trained and experienced in the use of cooperative and individualistic learning procedures hired especially for the study were paired with the junior high school teachers. At the midpoint of the study the two teacher teams exchanged conditions to control for possible teacher effects. Both teacher teams, therefore, spent an equal amount of time in each condition. Two special education teachers and two special education aides from the junior high school served as consultants on how to integrate the handicapped students into the regular classroom during the study. They consulted an equal time for each condition.

Six research assistants observed student oral interaction and the teacher implementation of conditions on a daily basis. There were at least two observers in each condition each day.

Dependent Variables

The dependent variables in this study were achievement, distance-density measure of interpersonal attraction, oral interaction, social-schema measures of interpersonal attraction, sociometric-nominations of interpersonal attraction, and several attitude scales. The achievement measure consisted of two tests, given after four and nine instructional days. These tests each contained 47 objective questions. The test items basically measured factual recall of the material studied. The tests were constructed by the research staff and the teachers involved in the study.

There were four measures of interpersonal attraction. The distance-density index (Zaidman, Note 1) measured the number of students within an area of constant size around each retarded student. The measure was designed to provide a numerical score for the social density of the immediate environment within a certain radius of the retarded individuals. A ten-foot radius was broken up into a series of concentric zones of distance around the target student. Two numerical values were associated with each zone, one number for the area in front of the target student and another lower value for the area in back of the target student. The students were given two periods of free-time, each lasting 30 minutes, at the end of the study. Students were free to associate with anyone they wished to in the classroom.

The observers recorded the placement of peers within a ten-foot radius of the retarded students. A larger distance-density index (DDI) score was assigned to retarded students in close proximity to and facing other students.

The sociometric measure consisted of giving students the names of all the other students in their condition (ordered randomly), each of which appeared on a sticker. The students were instructed to sort the name stickers into seven categories indicating how much they would like to sit with each classmate. The categories were scored on a seven-point scale, from most-liked to least-liked. The two conditions were then compared on the ratings the nonhandicapped students gave to their retarded peers.

The figure-placement social-schema measure consisted of placing a classroom diagram in front of each student and giving them the names of all the other students in their condition (ordered randomly), each of which appeared on a sticker. The students were asked to imagine that it was free time in class and were instructed to place the stickers on the classroom diagram at the spots where the students would be playing in the room. They were then instructed to draw a circle around the groups of students who were engaged in an activity together. The total number of nonhandicapped and retarded students engaged in an activity together was recorded for each student. A second measure was taken by noting the percentage of retarded students who were placed as being totally isolated from all peers. This measure was given at the end of the study.

The instructional interaction measure (Lyons, 1982; Roy, Note 2) consisted of observing the direction and content of all student comments made during the instructional sessions. The direction included statements made to a retarded or nonhandicapped peer, and to the group or cluster as a whole.

The content of each statement was classified as task (communications reflecting cognitive processing of the math content), management (communications reflecting rules, directions, and procedures for completing the assignments), and social (expressions of feelings, personal comments, and off-task comments). Each of the six observers received 25 hours of training on the observation instruments. Observers rotated conditions so that they observed each condition an equal number of times. The interrater reliability was over 85 percent using a ratio of aggreements to coded occurrences.

Five attitude scales were administered at the end of the study. Two of the scales were developed by the authors and used in a number of previous studies. The peer-academic-support scale consisted of two items dealing with whether other students liked to help one learn and cared about how much one learned. The success as a student scale consisted of three items dealing with doing a good job of learning in the class. Two scales developed by Talmage and Waxman (1980, Note 3) were given. The cooperation scale consisted of four questions dealing with working with other students and helping them learn. The individualistic scale consisted of four questions dealing with working alone without interacting with other students. To each question students answered on a five-point scale. These latter two scales were used to verify that the conditions had been successfully implemented. Students' total scores on each scale were divided by the number of questions in the scale. All scales had Cronbach Alphas above .80. Finally, retarded students were asked individually whether or not they belonged in the class, which was scored as "yes" or "no."

Analyses

T-tests were used to analyze the differences between conditions. Exceptions were a Mann-Whitney test to analyze the DDI measure and a Fisher exact probability test to analyze the "belonging" question.

Experimental Check

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

Results

On both the first achievement test (Cooperative = 25.28, Individualistic = 27.74, $t(35) = -1.36$, $p < .20$) and the second achievement test (Cooperative = 38.00, Individualistic = 34.74, $t(35) = 1.48$, $p < .20$) there were no significant differences between conditions.

Insert Table 1 About Here

Interpersonal attraction between handicapped and nonhandicapped students was measured by their DDI during free-time, the social-schema figure-placement task, the sociometric measure, and the handicapped's sense of longing (see Table 1). There was more clustering together of students near the handicapped students during post instructional free time in the cooperative than in the individualistic condition as measured by the DDI, $p < .114$, Mann-Whitney test. In the cooperative, compared with the individualistic, condition more nonhandicapped and handicapped students were placed as engaging in a joint activity together during post-instructional free-time, $t(33) = 2.75$, $p < .005$, and fewer handicapped students were placed as being isolated from all other students, $t(33) = 3.83$, $p < .005$. More nonhandicapped students in the cooperative, compared with the individualistic, condition indicated a desire to sit with their handicapped conditionmates, $t(34) = 3.52$, $p < .005$. Finally, the handicapped students in the cooperative condition indicated more feelings of belonging than did the handicapped students in the individualistic condition, $p = .01$, using Fisher's exact probability test.

Insert Table 2 About Here

From Table 1 it may be seen that nonhandicapped students in the cooperative condition, furthermore, tended to feel more successful as students, $t(36) = 1.33$, $p < .10$, and perceived more academic support for achievement from peers, $t(36) = 2.68$, $p < .01$, than did nonhandicapped students in the individualistic condition. Nonhandicapped students in the cooperative, compared with the individualistic, condition perceived their condition as being more cooperative, $t(36) = 6.88$, $p < .001$, and less individualistic, $t(36) = 11.93$, $p < .001$.

From Table 2 it may be seen that far more task, management, and social interactions took place between the handicapped and the nonhandicapped students in the cooperative than in the individualistic condition. This was true for both interactions initiated by the nonhandicapped toward the handicapped students, and for interactions initiated by the handicapped toward the nonhandicapped students. When the interactions between the nonhandicapped students were compared, more task and management interactions took place in the cooperative condition. Within the cooperative condition, furthermore, nonhandicapped students initiated more task (NH-H = .321, NH-NH = .156, $t(14) = 2.81$, $p < .05$) and more social (NH-H = .043, NH-NH = .026, $t(14) = 2.07$, $p < .10$) interactions toward their handicapped groupmates than toward their nonhandicapped groupmates. (The means reported were adjusted for the number of handicapped and nonhandicapped groupmates available to interact with.) There were no significant differences in the number of interactions initiated by the nonhandicapped students toward their handicapped groupmates and vice versa.

Discussion

When severely adaptively handicapped students are mainstreamed there are questions as to whether the achievement of the nonhandicapped students will be affected, whether the handicapped students will withdraw from interaction with their nonhandicapped peers, whether nonhandicapped students will ignore and ostracize their handicapped peers, and whether the nonhandicapped students will reject and dislike their handicapped peers. Achievement of the nonhandicapped students in the cooperative condition was basically unaffected by working collaboratively with severely handicapped peers in this study. The severely adaptively handicapped students, furthermore, did not withdraw from the cross-handicap interaction required in the cooperative condition. They participated in far more task, management, and social interactions with the nonhandicapped students in the cooperative than in the individualistic condition. They also felt that they belonged more compared to their counterparts in the individualistic condition. And there is no evidence that the nonhandicapped students will ignore, avoid, or ostrasize their educable mentally retarded peers in the cooperative condition, as the nonhandicapped students participated in as many or more task, management, and social interactions with their handicapped peers as they did with their nonhandicapped peers.

There were a number of measures of interpersonal attraction between educable mentally retarded and nonhandicapped students in this study. They uniformally indicate that placing severely adaptively handicapped and nonhandicapped students in heterogeneous cooperative learning groups promotes greater cross-handicap interpersonal attraction than does having them work individualistically within the same classroom. These results provide some evidence that even severely handicapped students may be successfully integrated into constructive relationships with nonhandicapped peers when the classroom activities are structured cooperatively.

The results of this study indicate that the classroom climate was much more supportive in the cooperative than in the individualistic condition. The severely handicapped students felt more like they belonged and the nonhandicapped students felt more academic support from peers and perceived the class to be more cooperative and less individualistic. This study, furthermore, provides some evidence nonhandicapped students' academic self-esteem is promoted by participating in heterogeneous cooperative learning groups, as they felt more successful as students than did their counterparts in the individualistic condition.

The results of this study are limited by the nature of the sample, the curriculum, the time-span of the intervention, and the operationalizations of the dependent and independent variables. This study's results, however, are all the stronger due to the random assignment of students to conditions, the use of highly trained teachers to conduct the instruction, the rotation of teachers across conditions, the specific operationalizations of the cooperative and individualistic conditions, and the behavioral nature of several of the dependent variables.

The results of this study have important implications for educational practice. In many schools severely adaptively handicapped students are segregated or are mainstreamed in highly individualistic ways (i.e., required to work on their own, on individualized materials, and with a minimum of interaction with their classmates). The results of this study provide some indication that cooperative learning procedures should be utilized in mainstreaming severely adaptively handicapped students. There are a number of ways in which the special education teacher can facilitate the integration of severely handicapped students in cooperative learning groups. Of considerable importance is for the special education teacher to instruct nonhandicapped group members on the strategies that are most effective in working with their severely handicapped peers. The severely adaptively handicapped students, furthermore, may be coached in the social skills they need to work effectively in cooperative learning groups. The nonhandicapped students may need to be instructed to carry on with their own learning while simultaneously assisting their severely handicapped group member. Finally, the special education teacher should give the nonhandicapped students feedback as to how successful they are working with their handicapped group member. Especially with severely adaptively handicapped students successes are often measured in small degrees. For example, in this study when one of the handicapped students in the cooperative condition picked up and passed out papers to the group members, remembering each member's name, this was a first for him. Such progress could be overlooked by the nonhandicapped students.

Reference Notes

1. Zaidman, B. The distance-density index. University of Minnesota, Cooperative Learning Project, Technical Report, 1980.
2. Roy, P. Analysis of student conversations in cooperative learning groups. Masters thesis, University of Minnesota, 1982.
3. Talmage, H., & Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle; Office of Evaluation Research; Technical Report 131; August, 1980.

References

Allport, G. The nature of prejudice. Cambridge, MA: Addison-Wesley, 1954.

Cohen, E. The effects of desegregation on race relations. Law and Contemporary Problems, 1975, 39, 271-279.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), Nebraska Symposium on Motivation. Lincoln, NE: University of Nebraska Press, 1962.

Goodman, H., Gottlieb, J., & Harrison, R. Social acceptance of EMR's integrated into a nongraded elementary school. Americal Journal of Mental Deficiency, 1972, 76, 412-417.

Gottlieb, J., & Budoff, A. Social acceptability of retarded children in nongraded schools differing in architecture. American Journal of Mental Deficiency, 1973, 78, 15-19.

Gottlieb, J., Cohen, L., & Goldstein, L. Social contact and personal adjustment as variables relating to attitudes toward educable mentally retarded children. Training School Bulletin, 1974, 71, 9-16.

Gottlieb, J., & Davis, J. Social acceptance of EMR children during overt behavioral interactions. American Journal of Mental Deficiency, 1973, 78, 141-143.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, NJ: Prentice-Hall, 1975.

Johnson, D. W., & Johnson, R. Cooperative, competitive, and individualistic learning. Journal of Research and Development in Education, 1978, 12, 3-15.

Johnson, D. W., Johnson, R., & Maruyama, G. Interdependence and interpersonal attraction among heterogeneous and homogeneous individuals: A theoretical formulation and a meta-analysis of the research. Review of Educational Research, 1983, 53, in press.

Johnson, D. W., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. The effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. Psychological Bulletin, 1981, 89, 47-62.

Johnson, R., Rynders, J., Johnson, D. W., Schmidt, B., & Haider, S. Producing positive interaction between handicapped and nonhandicapped teenagers through cooperative goal structuring: Implications for mainstreaming. American Journal of Educational Research, 1979, 16, 161-168.

Lyons, V. M. A study of elaborative cognitive processing as a variable mediating achievement in cooperative learning groups. Ph.D. dissertation, University of Minnesota, 1982.

Rucker, C., Howe, C., & Snyder, B. The acceptance of retarded children in junior high academic and nonacademic classes. Exceptional Children, 1969, 35, 617-623.

Rynders, J., Johnson, R., Johnson, D. W., & Schmidt, B. Effects of cooperative goal structuring in productive positive interaction between Down's Syndrome and nonhandicapped teenagers: Implications for mainstreaming. American Journal of Mental Deficiency, 1980, 85, 268-273.

Sharan, S. Cooperative learning in teams: Recent methods and effects on achievement, attitudes, and ethnic relations. Review of Educational Research, 1980, 50.

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Table 1

Mean Responses by Nonhandicapped on Attitude and Interpersonal Attraction

	Cooperative	Individualistic	Significance
Distance Density Index	22.46	16.81	$p < .11$[d]
Social Schema: Retarded Integration	1.97	1.08	$t = 2.75$ ***
Social Schema: Percentage of Handicapped Alone	14.10	55.30	$t = 3.83$ ***
Sociometric[a]	3.10	2.22	$t = 3.32$ ***
We (Handicapped) Belong[c] in Class	75.00	0	$p < .01$[e]
Perceive Success as[b] Student	3.34	3.17	$t = 1.33$ *
Peer Academic Support	3.28	1.70	$t = 2.68$ **
Cooperation[b]	4.03	1.54	$t = 6.88$ ****
Individualistic[b]	2.00	4.44	$t = 11.93$ ****

*$p < .10$; **$p < .01$; ***$p < .005$; ****$p < .001$

[a] 1-7 scale; higher numbers indicate greater desire to sit with student

[b] 1-5 scale; 1 = disagree, 5 = agree

[c] Percentage of "yes" answers

[d] Mann-Whitney test

[e] Fisher's exact probability test

Table 2

Mean Verbal Interaction Per Minute During Instructional Sessions

		Cooperative	Individualistic	t-Value (2-tailed test)
NH-H:	Task	.321	.012	5.95***
NH-H:	Management	.132	0	4.99***
NH-H:	Social	.043	0	4.29***
H-NH:	Task	1.331	.026	4.36**
H-NH:	Management	.363	.008	3.34**
H-NH:	Social	.171	.008	3.16*
NH-NH:	Task	.312	.049	4.73***
NH-NH:	Management	.203	.052	3.94***
NH-NH:	Social	.052	.032	ns

NOTE: *p < .05, **p < .01, ***p < .001

NH = Nonhandicapped; H = Handicapped

The Effect of Effort in Communicating on Cooperation and Interpersonal Attraction: Mainstreaming Hearing-Impaired Students

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Running Head: Mainstreaming Hearing-Impaired

Abstract

The effects of cooperative and individualistic learning experiences were compared on interaction and relationships between hearing and hearing-impaired students. Two contradictory theories were tested, one stating that the effort required for hearing and hearing-impaired students to communicate would lead to frustration, withdrawal and exclusion, and rejection; the other stating that cooperative learning experiences would lead to cross-handicap interpersonal attraction regardless of communicaion difficulties. Thirty third-grade students (20 hearing and 10 hearing-impaired) were assigned to conditions on a stratified random basis controlling for handicap, sex, and ability level. They participated in the study for 55 minutes a day for 15 instructional days. The results indicate that cooperative learning experiences, compared with individualistic ones, promoted more interaction and interpersonal attraction between hearing and hearing-impaired students.

The Effect of Effort in Communicating on Cooperation and Interpersonal Attraction: Mainstreaming Hearing-Impaired Students

One of the requirements for productive cooperation is effective communication (Deutsch, 1962; Johnson, 1974; Johnson & Johnson, 1975). Difficulties in communication have been found to make cooperation harder to achieve and maintain (Deutsch, 1962; Deutsch & Krauss, 1962). On the basis of this research it is often posited that the greater the effort required to communicate with collaborators, the more frustrating the experience will be, the less frequently collaborators will attempt to communicate with each other, the less productive cooperative efforts will be, and the less the collaborators will like each other. There is considerable research, however, indicating that cooperation promotes greater interpersonal attraction among collaborators than do competitive or individualistic experiences (Johnson, Johnson, & Maruyama, Note 1), supporting the proposition that regardless of the effort required for communicating, cooperation will promote increased interpersonal attraction among collaborators.

Studying the mainstreaming of hearing-impaired students in cooperative and individualistic learning situations provides a setting in which to examine the effects of effort in communicating on cooperation and interpersonal attraction among heterogeneous peers. The current evidence on interaction between hearing-impaired and hearing students supports the frustration-withdrawal-rejection hypothesis. The research indicates that hearing-impaired students become frustrated with their attempts to communicate with hearing peers and withdraw from the interaction and correspondingly, hearing students become frustrated with their attempts to communicate with hearing-impaired peers and withdraw (Meadow, 1975). The frustration and withdrawal may very well lead to mutual rejection and dislike. Since there are few studies examining the impact of communication difficulties on the processes affecting interpersonal attraction in cooperative situations, a direct test of the frustration-withdrawal-rejection hypothesis against the cooperation-liking hypothesis is needed. The mainstreaming of hearing-impaired students presents a unique opportunity to do so.

A *cooperative* learning situation is one where students can achieve their goals if and only if the other students with whom they are cooperatively linked achieve their goals (Deutsch, 1962). Cooperation is often contrasted with *individualistic* learning, where students' goal attainments are unrelated to and independent from each other. In addition to the issue of whether communication difficulties will disrupt the processes within cooperation leading to interpersonal attraction, there is a question as to whether lower achievement levels by certain members of cooperative groups will disrupt those same processes. A number of theoretical perspectives would predict that when hearing-impaired students perform at a lower academic level than their hearing peers cooperative experiences would tend to promote increased rejection of the hearing-impaired students. Deutsch's (1949, 1962) original theory of cooperation predicts that when a group member frustrates the goal achievement of the group, a negative cathexis results that is generalized to the low achiever and the low achiever is then disliked. Despite the large amount of research on cooperation, the "bunglers will be disliked in cooperation" hypothesis has generated little research. Similar predictions are made by contact theory (Allport, 1954) and expectation-states-theory

(Cohen, 1975). The active-encouragement position, however, makes the opposite prediction that when peers of different achievement levels work cooperatively and all are perceived as exerting effort to contribute to the group's work, then interpersonal attraction will result regardless of members' actual performance (Johnson & Johnson, 1972; Tjosvold, Johnson, & Johnson, 1981). The validity of the theoretical positions can be tested by observing the interaction between hearing-impaired and hearing students within cooperative and individualistic learning situations and measuring the strength of their acceptance and liking for each other.

The mainstreaming of hearing-impaired students is of interest for a number of developmental and educational reasons (Meadow, 1975). Hearing-impaired students have fewer opportunities for social interaction and their language acquisition and social development usually suffer as a result. Hearing-impaired students often experience considerable frustration trying to communicate with hearing peers and vice versa, thus creating withdrawal and avoidance of interaction with one another. The topics of conversation when hearing-impaired and hearing students interact are often limited to topics with a visual reference and there is usually a marked lack of discussion of the qualities of objects, abstract relationships, and future plans. Since socialization and social development take place primarily through verbal communication, the isolation of hearing-impaired students has serious consequences. It is of considerable importance, therefore, to find ways of mainstreaming hearing-impaired students so that considerable interaction with hearing students takes place and constructive cross-handicap relationships result.

The vast majority of the research comparing the relative impact of cooperative and individualistic goal structures on interpersonal attraction between handicapped and nonhandicapped peers has focused on mildly and moderately handicapped students (Johnson, Johnson, & Maruyama, Note 1). Advocates of cooperative learning often give the impression that any handicapped student may be successfully integrated into constructive relationships with nonhandicapped students in any academic area. Skeptics often note that there may be limits to what cooperative interaction may achieve and that it will not be successful when severely handicapped students are included in cooperative learning groups. Neither advocates of cooperative learning nor skeptics have conducted systematic research examining the impact of severely handicapped students, whose handicaps increase the effort required to cooperate effectively, on the processes and outcomes of cooperation. By focusing on severely hearing-impaired students, this study will do so.

One of the processes that may mediate or moderate any relationship between mainstreaming and interpersonal attraction between handicapped and nonhandicapped students is perspective-taking. Cognitive perspective-taking may be defined as the ability to understand how a situation appears to another person. The opposite of perspective-taking is egocentrism, where individuals are so embedded in their own frame of reference that they are unaware of other points of view and of the limitations of their own perspective. The more accurately a hearing student understands how being hearing-impaired affects one's life at school, the more open the student may be to constructive interaction with hearing-impaired peers.

There are, therefore, unanswered questions concerning the impact of communication difficulties on productivity and relationships among members of cooperative groups, the severity of handicap of members of cooperative groups and their relationships with nonhandicapped collaborators, and the impact of including lower achieving group members on relationships among collaborators. There are also questions concerning whether hearing-impaired students can be successfully mainstreamed. These questions can be directly addressed through contrasting the integration of hearing-impaired students into cooperative and individualistic learning situations with hearing peers. The impact of the communication difficulties and achievement discrepancies between hearing-impaired and hearing students will be examined on their interaction, their achievement, and their relationships with one another.

Method

Sample

Subjects were 30 third-grade students from three separate classrooms (two regular and one special-education) in a midwestern metropolitan school district. The sample consisted of 20 hearing and 10 hearing-impaired students. Eight of the hearing-impaired students were totally without hearing and two had some hearing with a hearing aid. Only one hearing-impaired student could function without an interpreter and this student randomly ended up in the individualistic condition. Because of the hearing-impaired students attending the same school, many of the hearing students knew some signing. The hearing-impaired students prior to this study attended almost totally a segregated classroom within which instruction was based on signing.

The sample consisted of 18 males and 12 females. All students were randomly assigned to the two conditions stratifying for handicapping condition, sex, and ability level. There were an equal number of high, middle, and low achieving students, males and females, and hearing and hearing-impaired students in each condition.

Independent Variables

The independent variable was cooperative versus individualistic learning situations. In the cooperative condition students were instructed to work together as a group, completing one set of papers as a group while ensuring that all group members mastered the material, with all group members giving their ideas and suggestions, and with the teacher praising and rewarding the group as a whole. Students were placed in five groups of three students each on a stratified random basis, ensuring that the groups were balanced for handicap, sex, and ability level. There were one hearing-impaired and two hearing students in each group. In the individualistic condition, students were instructed to work on their own, avoiding interaction with other students, and with the teacher praising and rewarding each student individually. Students were seated in clusters of three (one hearing-impaired and two hearing students).

Procedure

Students in each condition were together for 55 minutes a day for 15 instructional days. Each condition was assigned a separate classroom comparable in size. The curriculum unit used for instruction was a math unit dealing with addition and subtraction with money. Each day the teachers would explain the day's task to the students, distribute the appropriate materials, and review the condition's goal structure. At the end of the instructional session the completed work and all materials were collected. Both teachers followed a daily script detailing what they were to say and do each day.

Research Personnel

Two teachers participated in the study. Both teachers were highly experienced in conducting cooperative and individualistic lessons and had received over 90 hours of training in how to structure the two conditions. Both were certified teachers. Four research assistants observed student verbal interaction on a daily basis in both conditions. Each observer received 25 hours of training on the observation instruments. There were at least two observers in each condition each day. Observers rotated conditions so that they observed each condition an equal number of times. The research assistants observed the group in random order for five two-minute intervals. They conducted interrater reliability checks during the classroom observation sessions. Interrater reliability was over 85 percent for the observation instruments (using the Harris and Lahey {1978} method for combining the weighting occurrence and nonoccurrence of agreement. There were 6 interpreters participating in the study. Five participated in the cooperative condition and 1 participated in the individualistic condition. The interpreters in the cooperative condition were trained to sit with their group and interpret for the hearing-impaired member anything he or she did not understand, and to interpret for the hearing members anything they could not understand that the hearing-impaired student was trying to communicate. In the individualistic condition, one interpreter sat at the front of the class and signed everything the teacher said to the class.

Dependent Variables

The dependent variables were achievement, interpersonal attraction between hearing-impaired and hearing students, interaction between hearing-impaired and hearing students during instruction, and attitudes related to learning. The achievement measure consisted of three teacher constructed tests on the math material being studied given after 5, 10, and 15 days of instruction. The tests contained 20, 20, and 28 objective questions respectively.

There were five interpersonal attraction measures. The sociometric measure consisted of giving students a picture of all the other students in their condition. Students were instructed to sort the pictures into five categories indicating whom they would most like to sit with to whom they would least like to sit with. The categories were scored on a five-point scale. The two conditions were then compared on the ratings the hearing students gave to their hearing peers and their hearing-impaired peers.

The figure-placement social-schema measure consisted of placing a classroom diagram in front of each student and giving them the names of all the other students in the condition (ordered randomly), each of which appeared on a sticker. The students were asked to imagine that it was free time in the class and instructed to place the stickers on the classroom diagram at the spots where the students would be playing in the room. They were then instructed to draw a circle aroung the groups of students who were engaged in an activity together. The total number of hearing students engaged in an activity with hearing-impaired students was recorded for each student. A second measure was taken by noting the percentage of all students totally isolated who were hearing impaired.

The activities list measure (Siperstein, Note 2) gives an indication of the hearing students' behavioral intentions toward their hearing-impaired peers. Thirty-three activities that students would like to do with their friends were presented and the hearing students were asked to designate whether or not they would like to do this activity with the hearing-impaired student in their group or cluster. Their responses were scored on a 1 to 3 point scale depending on whether they responded "no," "don't know," or "yes," and a total score for all the activities was derived by summing their responses. The Chronbach Alpha for this scale was .94. Finally, an acceptance of the hearing-impaired attitude scale was administered. The scale consisted of two questions indicating how happy the hearing students were in working with their hearing-impaired peers and whether working with hearing-impaired students slowed the hearing students down. Each question was scored on a three-point scale and the responses summed.

The instructional interaction measure (Lyons, 1982; Roy, Note 3) consisted of observing the direction, mode, and content of all student comments made during the instructional sessions. The direction included statements made to a hearing or hearing-impaired peer, to the group or cluster as a whole, to an interpreter, and to the teacher. The modes included oral, signing, and other (gestures, demonstrating an action, pointing to a problem or a person, and acting something out). The content of each statement was classified as task (communications reflecting cognitive processing of the math content), management (communications reflecting rules, directions, and procedures for completing the assignments), and social (expressions of feelings, personal comments, and off-task comments).

Finally, four attitude scales were administered. Two of the scales were developed by the authors and used in a number of previous studies. The peer-academic-support scale consisted of two items dealing with whether other students like to help one learn and care about how much one learned. The success as a student scale consisted of three items dealing with doing a good job of learning in the class. Two scales developed by Talmage and Waxman (1980; Note 4) were given. The cooperative scale consisted of four questions dealing with working with other students and helping them learn. The individualistic scale consisted of three questions dealing with working alone without interacting with other students. To each question students answer "no," "don't know," or "yes." These latter two scales were used to verify that the conditions had been successfully implemented. Students' total scores on each scale were divided by the number of questions in the scale. All scales had Cronbach Alphas above .80.

The perspective-taking measure was designed to measure the ability of the hearing students to take the cognitive perspective of their hearing-impaired peers. Each hearing-impaired student was interviewed and asked a series of questions concerning what math class was like for them, what they liked and disliked about it, and what was easy and hard for them to do. Eight hearing students were randomly picked from each condition and interviewed as to how the hearing-impaired student in their group or cluster responded to the questions. The percentage of accurate responses was taken as an indication of accuracy of perspective-taking.

Analyses

A two-way ANOVA was used to analyze the achievement data. _T_-tests were used to analyze differences between the hearing students in the two conditions for the other measures.

Experimental Check

Each classroom was observed daily to verify that the conditions were being taught cooperatively and individualistically. The results of these observations verified that the conditions were being implemented appropriately.

Results

The first dependent variable was achievement. From Table 1 it may be seen that there were no significant differences between conditions on achievement, but that the hearing-impaired students performed significantly lower than did their hearing peers, $F(1,25) = 13.23$, $p < .001$.

Interpersonal attraction between hearing and hearing-impaired students was measured by several dependent variables. From Table 2 it may be seen that the hearing students in the cooperative condition indicated more liking for their hearing-impaired peers on the sociometric measure, $t(18) = 1.78$, $p < .05$; placed themselves as associating more with hearing-impaired peers during free-time, $t(16) = 1.49$, $p < .10$, and placed fewer hearing-impaired students on the social-schema measure; as being isolated from all other students, $t(14) = 1.78$, $p < .05$; indicated more willingness to associate with hearing-impaired peers in a wide variety of situations, $t(18) = 1.59$, $p < .10$; and indicated more acceptance of the hearing-impaired on the attitude measure, $t(17) = 2.30$, $p < .01$.

Hearing students in the cooperative condition, furthermore, perceived their condition as being more cooperative, $t(17) = 6.04$, $p < .001$, and less individualistic, $t(17) = 9.05$, $p < .001$, than did the hearing students in the individualistic condition. Hearing students in the cooperative condition felt more successful as students, $t(17) = 2.40$, $p < .01$, and perceived more adacemic support for achievement from peers, $t(17) = 2.19$, $p < .01$, than did the hearing students in the individualistic condition.

From Table 2 it may also be seen that the hearing students in the cooperative condition were more accurate in taking the perspective of their hearing-impaired peers than were the hearing students in the individualistic condition, $t(14) = 2.07$, $p < .05$.

Insert Tables 1 and 2 Here

The observation results are in Table 3. Far more task, management, and social interaction between nonhandicapped and hearing-impaired students took place in the cooperative, as compared with the individualistic, condition. That interaction included oral statements, signing, and other forms of communication such as pointing and demonstrating. The hearing-impaired students in the cooperative condition communicated primarily through signing and pointing and demonstrating, while the nonhandicapped students communicated primarily through oral statements and signing. There was also considerable communications in the cooperative condition aimed at all one's groupmates rather than to any specific person. As would be expected by the makeup of the groups, there was considerable more communication between hearing students but not much between the hearing-impaired students. Hearing students in the cooperative condition engaged in more task and management interaction with the teacher than did the hearing students in the individualistic condition, but the hearing-impaired students in the individualistic condition had more task interaction with the teacher than did the hearing-impaired students in the cooperative condition. Finally, the hearing students in the cooperative condition interacted more with the interpreters on task and management issues than did the hearing students in the individualistic condition, while the hearing-impaired students in the cooperative condition engaged in more task interaction with the interpreter than did the hearing-impaired students in the individualistic condition.

Insert Table 3 About Here

From Table 4 it may be seen that within the cooperative condition, when hearing-to-hearing-impaired interaction is compared with hearing-impaired-to-hearing interaction, there are no significant differences for task, management, and social statements. When hearing-to-hearing-impaired interaction is compared with hearing-to-hearing interaction, it may be seen that there tended to be more hearing-to-hearing interaction in the management, $t(9) = 3.22$, $p < .05$, and social, $t(9) = 3.35$, $p < .05$, categories, but not in the task category.

Insert Table 4 About Here

There are a number of results from the interviews that support the data presented in Tables 1, 2, 3, and 4. When asked whether they liked their hearing condition-mates, 80 percent of the hearing-impaired students in the cooperative condition responded "yes," while only 20 percent of the hearing-impaired students in the individualistic condition did so. One-hundred percent of the hearing-impaired students in the cooperative condition indicated that they had learned something about their hearing peers while only 40 percent of the hearing-impaired students in the individualistic condition did so. When the hearing students were interviewed, 63 percent in the cooperative condition responded that it was fun to work with the hearing-impaired students, while none of the hearing students in the individualistic condition did so. In describing their hearing-impaired peers, 75 percent of the cooperative hearing students accurately identified their handicap while only 13 percent of the hearing students in the individualistic condition did so. Thirteen percent of the cooperative hearing students believed that the hearing-impaired students felt left out while 50 percent of the individualistic hearing students believed so.

Discussion

This study compared the interaction and relationships between hearing-impaired and hearing students in cooperative and individualistic learning situations to determine the answers to a number of overlapping questions:

1. Will the greater effort required for communicating undermine the processes of cooperation and result in the hearing-impaired students withdrawing from the cooperative efforts, the hearing students excluding the hearing-impaired from the group's efforts, the hearing students' perceptions of cooperation being lower, the hearing students' achievement being lowered, and the hearing-impaired and hearing students' relationships being damaged?
2. Will being required to work cooperatively with hearing-impaired students reduce hearing students' liking for them due to resentment for having to work with handicapped peers, frustration in trying to communicate, and having one's achievement lowered by the slower progress and lower achievement level of the hearing-impaired students?
3. Will lower achieving, handicapped students be disliked in cooperative learning situations due to their frustrating the efforts of nonhandicapped peers to work speedily?
4. Will the findings that cooperation promotes positive interaction and relationships between mildly and moderately handicapped students be corroborated when severely handicapped students are included in cooperative situations?
5. Can hearing-impaired students be successfully mainstreamed?

The hypothesis that the greater the effort required for communication among collaborators the less frequent the communication and the lower the productivity of and liking among collaborators will be was directly tested through the observation, achievement, and interpersonal attraction measures.

There were three areas of communication in which hearing-impaired students could withdraw or be excluded. Communication could break down on task efforts, on managing and coordinating task efforts, or on social interaction. The results of this study indicate that there is considerable interaction between hearing-impaired and hearing students in the cooperative condition. In the task area within the 55 minute instructional session the hearing students initiated an average of over 36 cross-handicap interactions and the hearing-impaired students initiated over [illegible] such interactions. In the individualistic condition the hearing-impaired students initiated two cross-handicap interactions in every four instructional sessions and the hearing students only initiated one such interaction in every four instructional sessions. The hearing students initiated about 25 task interactions with each other during an instructional period. These results clearly indicate that the effort involved in communicating did not result in withdrawal or exclusion of the hearing-impaired students in the cooperative condition. In coordinating and managing the group's task efforts the hearing students on the average initiated over 14 cross-handicap interactions and the hearing-impaired students averaged over 12 such interactions. There was only one cross-handicapped management interaction in the individualistic condition. In the cooperative condition the hearing students averaged over 31 management interactions per instructional period. Both the hearing and the hearing-impaired students in the cooperative condition averaged about 4 social interactions during each instructional period while in the individualistic condition there were practically no cross-handicapped social interactions. The hearing students in the cooperative condition engaged in an average of

13 social interactions per instructional period. These results indicate that the hearing-impaired students did not withdraw from and were not excluded from the task, management, or social interactions within the cooperative group, but that there were more management and social interactions between the hearing students than between the hearing and the hearing-impaired students.

There can be little doubt that the communication between the hearing-impaired and hearing students did take some effort. Since the hearing students could sign only minimally and the hearing-impaired students could talk and lip-read only minimally, could not hear, and needed an interpreter to function in the classroom, there was considerable doubt as to how communication would be managed in the cooperative condition and how frustrating it would be to both the hearing-impaired and the hearing students. The results of this study indicate that the hearing and hearing-impaired students used a combination of oral, sign, and other (demonstrations and gestures such as pointing that are not part of sign language) communication. The hearing students used considerable oral communication while the hearing-impaired students concentrated on signing and other gestures for their communication. It is of interest that they communicated directly more frequently than they communicated through interpreters. These results indicate that while communicating did take effort, the students were far more resourceful in communicating with each other than many educators commonly believe and the role of the interpreter may be less essential when students work cooperatively than when a class is taught competitively, individualistically, or in a lecture format.

The achievement results of this study indicate that hearing-impaired students did achieve at a considerable lower level than did their hearing peers. Having to work collaboratively with much lower achieving, hearing-impaired peers did not, however, interfere with the achievement of the hearing students in the cooperative condition. These findings should provide some reassurance to educators who fear that mainstreaming severely handicapped students in cooperative learning activities will pull down the achievement of the nonhandicapped students.

Working with hearing-impaired, lower-achieving peers could be a highly frustrating experience. Frustration was measured by obtaining an indication of how successful hearing students felt during math class. The results indicate that hearing students in the cooperative condition felt more successful as students than did the hearing students in the individualistic condition. Hearing students in the cooperative condition also felt more academically supported by their peers than did individualistic hearing students. Having severely handicapped collaborators with whom it took considerable effort to communicate did not seem to be a frustrating experience in this study.

There were a number of measures of interpersonal attraction between hearing-impaired and hearing students in this study. They uniformally indicate that placing hearing-impaired and hearing students in heterogeneous cooperative learning groups promotes greater interpersonal attraction than does having them work individualistically within the same classroom. These results indicate that even severely handicapped students may be successfully integrated into constructive relationships with nonhandicapped peers when the classroom activities are structured cooperatively. These results may also provide some hope for educators and psychologists concerned with the social isolation of hearing-impaired children and adolescents and the impact of that isolation on their socialization and development.

There is almost no previous evidence that the nonhandicapped students gain cognitively or socially from their contact with nonhandicapped peers in mainstreaming situations. The results of this study provide evidence that hearing students who work collaboratively with hearing-impaired peers are somewhat more accurate in taking the perspective of their hearing-impaired condition-mates than are hearing students in the individualistic condition. Since perspective-taking ability is related to a wide variety of factors involved in cognitive and social development, these results provide some indication that mainstreaming, when it involves heterogeneous cooperative learning groups, may provide important developmental experiences for nonhandicapped students.

To summarize, the results of this study indicate that communication between hearing-impaired and hearing students in the cooperative condition did take increased effort and creativity, but it was not experienced as frustrating, the hearing-impaired students did not tend to withdraw from the group's work, and the hearing students did not exclude the hearing-impaired students from the group's work. In the cooperative situation the hearing students felt more successful, academically supported by their peers, and cooperative, and did not achieve at a lower level, than if they had been working individualistically. The hearing-impaired and hearing students in the cooperative condition formed more constructive and positive relationships than did their peers in the individualistic condition. These results disconfirm the "frustration-withdrawal-rejection" hypothesis, the "bunglers will be disliked in cooperation" hypothesis, and the "equal status is required for interpersonal attraction" hypothesis. The results do support the "cooperation results in liking regardless of heterogeneity" hypothesis.

This study's results are all the stronger due to the random assignment of students to conditions, the use of highly trained teachers to conduct the instruction, the specific operationalizations of the cooperative and individualistic conditions, and the behavior nature of several of the dependent variables.

The results of this study have important implications for educational practice. In many classrooms mainstreaming is being conducted in highly individualistic ways. Students work on their own, on individualized materials, and with a minimum of task interaction with their classmates. The results of this study provide some indication that cooperative learning procedures should be utilized in mainstreamed classrooms.

Reference Notes

1. Johnson, D. W., Johnson, R. T., & Maruyama, G. Interdependence and interpersonal attraction among heterogeneous and homogeneous individuals: A theoretical formulation and a meta-analysis of the research. Submitted for publication, 1982.
2. Siperstein, G. Measuring children's attitudes toward the handicapped. Unpublished report, University of Massachusetts, 1980.
3. Roy, P. Analysis of student conversations in cooperative learning groups. Masters thesis, University of Minnesota, 1982.
4. Talmage, H., & Waxman, H. Principals as cooperative leaders. Chicago: University of Illinois, Chicago Circle; Office of Evaluation Research; Technical Report 131; August, 1980.

References

Allport, G. The nature of prejudice. Cambridge, MA: Addison-Wesley, 1954.

Cohen, E. The effects of desegregation on race relations. Law and Contemporary Problems, 1975, 39, 271-279.

Deutsch, M. An experimental study of the effects of cooperation and competition upon group process. Human Relations, 1949, 2, 199-232.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. Jones (Ed.), Nebraska symposium on motivation. Lincoln, NE: University of Nebraska Press, 1962, 275-320.

Deutsch, M., & Krauss, R. Studies of interpersonal bargaining. Journal of Conflict Resolution, 1962, 6, 52-76.

Harris, F., & Lahey, B. A method for combining occurrence and nonoccurrence interobserver agreement scores. Behavior Research and Therapy, 1978, 11, 523-526.

Johnson, D. W. Communication and the inducement of cooperative behavior in conflicts. Speech Monographs, 1974, 41, 64-78.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, NJ: Prentice-Hall, 1975.

Johnson, D.W., & Johnson, S. The effects of attitude similarity, expectations of goal facilitation, and actual goal facilitation on interpersonal attraction. Journal of Experimental Social Psychology, 1972, 8, 197-206.

Meadow, K. The development of deaf children. In M. Hetherington (Ed.), Review of child development research, Vol. 5. Chicago: University of Chicago Press, 1975, 441-508.

Lyons, V.M. A study of elaborative cognitive processing as a variable mediating achievement in cooperative learning groups. Ph.D. dissertation, University of Minnesota, 1982.

Tjosvold, D., Johnson, D. W., & Johnson, R. Effect of partner's effort and ability on liking for partner after failure on a cooperative task. The Journal of Psychology, 1981, 109, 147-152.

Footnotes

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Table 1

Mean Achievement

	Cooperative		Individualistic		
	H	HI	H	HI	*F*-Value
Achievement	56.00	34.40	57.00	42.40	CI: .68 H-HI: 13.23

NOTE: CI = cooperative-individualistic

H-HI = hearing-hearing-impaired

Table 2

Mean Response on Measure of Cross-Handicap Attraction and Attitude

	Cooperative Hearing	Individualistic Hearing	t-Values	D.F.
Sociometric Liking Hearing of Hearing-Impaired	2.92	2.36	1.78**	18
Social Schema: Hearing with Hearing-Impaired	1.90	.88	1.49*	16
Social Schema: Hearing-Impaired Isolates	4.00	27.50	1.78**	14[b]
Activities List[a]	2.36	2.07	1.59*	18
Acceptance of Hearing-Impaired	2.39	1.85	2.30***	17
Cooperation	2.83	1.43	6.04****	17
Individualistic	1.26	2.90	9.08****	17
Success as a Student	2.63	2.20	2.40***	17
Academic Support from Peers	2.39	1.70	2.19***	17
Percentage Accuracy of Perspective-Taking	35.5	17.4	2.07**	14

NOTE: H = Hearing; *$p < .10$; **$p < .05$; ***$p < .01$; ****$p < .001$

[a] The data was standardized separately for students responding about same and cross sex hearing-impaired groupmates. The conditions were compared by summing the standardized values.

[b] Only respondents with at least 1 person alone were included in analysis

Table 3

Mean Verbal Interaction Per Minute During Instructional Sessions

		Cooperative	Individualistic	t-values
H-HI:	Task	.657	.005	4.03***
H-HI:	Management	.260	0	4.00***
H-HI:	Social	.076	0	4.46***
HI-H:	Task	.644	0	4.99****
HI-H:	Management	.207	.004	3.33***
HI-H:	Social	.080	.004	3.59***
H-HI:	Oral	.765	.005	3.65***
H-HI:	Sign	.288	0	1.50
H-HI:	Other	.130	0	3.00**
HI-H:	Oral	.582	0	2.08*
H-HI:	Sign	.591	0	3.31**
H-HI:	Other	.342	.008	1.95*
H-Group:	Task	.884	0	4.63***
H-Group:	Management	.260	0	3.94***
H-Group:	Social	.110	0	3.10**
HI-Group:	Task	.320	0	4.92****
HI-Group:	Management	.067	.004	3.20**
HI-Group:	Social	.008	0	1.00

Table 3 (continued)

Mean Verbal Interaction Per Minute During Instructional Sessions

		Cooperative	Individualistic	_t_-values
H-H:	Task	.464	.060	3.91***
H-H:	Management	.573	.020	4.07***
H-H:	Social	.240	.078	2.42**
HI-HI:	Task	.007	.008	- .12
HI-HI:	Management	.014	.036	-1.30
HI-HI:	Social	.004	.004	- .11
H-T:	Task	.178	.054	4.13***
H-T:	Management	.174	.085	2.43**
H-T:	Social	.005	.021	- .99
HI-T:	Task	.020	.146	-3.34***
HI-T:	Management	.015	.072	-1.54
HI-T:	Social	0	.004	-1.00
H-Interpreter:	Task	.080	0	3.03**
H-Interpreter:	Management	.063	0	2.96**
H-Interpreter:	Social	.010	0	1.52
HI-Interpreter:	Task	.107	.035	2.06*
HI-Interpreter:	Management	.045	.027	.61
HI-Interpreter:	Social	.013	0	1.45

*_p_ < .10; **_p_ < .05; ***_p_ < .01; ****_p_ < .001

NOTE: H = Hearing; HI = Hearing Impaired; T = Teacher

Table 4

Comparison of Hearing and Hearing-Impaired Interaction Per Minute in the Cooperative Condition

	Hearing			Hearing-Impaired		
	H-HI	H-H	t-value	H-HI	HI-H	t-value
Task	.657	.464	-1.00	.657	.644	.08
Management	.260	.573	3.22*	.260	.207	.52
Social	.076	.240	3.35*	.076	.080	- .20

NOTE: H = hearing; HI = hearing-impaired

*$p < .05$

SECTION III

YEAR 3

Influence Strategy, Perspective-Taking, and Relationships Between High and Low Power Individuals in Cooperative and Competitive Contexts

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Running Head: Unequal Power Relationships

Abstract

Sixty-four undergraduates negotiated an exchange of resources in dyads. They had either high or low power relative to the other and negotiated within a cooperative or a competitive context. While many theorists have indicated that unequal power relationships are destructive, other theorists have indicated that unequal power relationships are constructive. It was proposed that both views of unequal power relationships may be valid under different situational contexts. The results confirm the hypothesis; within a competitive context unequal power relationships resulted in the high power person's use of coercion and the low power person's attempts to negotiate. Both high and low power subjects perceived their relationship to be dominated by egocentric focus on one's own goals and attempts to control the other to meet one's needs. Within a cooperative context, however, both high and low power subjects were highly inducible to each other's influences, needed resources were provided to each other, high trust and liking occurred between subjects, and subjects were more accurate in understanding each other's perspectives. Unequal power seems to undermine negotiations within a competitive context while not detracting from effective working relationships within a cooperative context.

Influence Strategy, Perspective-Taking, and Relationships Between High and Low Power Individuals in Cooperative and Competitive Contexts

Within the theoretical literature there exist two markedly different views of unequal power relationships. Social power may be defined as one person's control over resources valued by another (Johnson & Johnson, 1982). A high power person has control over more resources valued by the other than does a low power person. One view of unequal power relationships assumes that unequal power necessarily has a destructive impact and needs to be equalized for constructive interaction to take place. The other view assumes that unequal power pervades all relationships to some degree and has a positive impact on relationships. Both views of unequal power focus on such dependent variables as the influence strategies used, the accuracy of understanding of others' needs (i.e., perspective-taking), the fulfillment of others' needs, aspects of the relationship such as trust and mutual help, views of the power relationship, and interpersonal attraction. The purpose of this article is to resolve the controversy over whether unequal power relationships are positive or negative by demonstrating the situational conditions under which each view is valid.

More specifically, it is proposed that both views of unequal power relationships may be correct, depending on whether the context is cooperative or competitive. Deutsch (1962) defines a cooperative situation as one in which participants perceive their goal attainments as being positively correlated; participants can achieve their goals if and only if the other participants with whom they are cooperatively linked achieve their goals. A competitive situation is one in which participants perceive their goal attainments as being negatively correlated; participants can achieve their goals if and only if the other participants with whom they are competitively linked fail to achieve their goals. Deutsch posited that within a cooperative situation there will be high inducibility; that is, participants will be highly receptive to collaborators' influence, while within a competitive situation there will be low inducibility with participants resisting being influenced by competitors.

The negative view of unequal power relationships is based on evidence that when high and low power individuals negotiate with each other, their dominant influence strategies seem to be coercion by the high power person and submission by the low power person (Jones, 1964; Rubin & Brown, 1975). There is evidence that high and low power individuals will mispercieve each other's needs and act in ways to enhance one's own interests over the other's (Appelbaum, 1974; Kipnis, 1972, 1975; Pfeffer & Salancik, 1974; Solomon, 1960; Thibaut & Reicken, 1955; Tjosvold & Fabrey, 1980). The relationship between high and low power individuals has been found to be characterized by mistrust and a refusal to help each other (Solomon, 1960); Thibaut & Reicken, 1955). High and low power individuals have been found to dislike and undervalue each other (Cohen, 1975, 1980; Kipnis, 1972, 1975). Within the academic setting, for example, Cohen (1975, 1980) hypothesizes that in order for students to form constructive relationships with one another they must be able to contribute equal resources to completing assigned academic work. When students with high and low reading ability are assigned a joint task Cohen assumes that the differences in reading ability will be a devisive influence on their relationship, promoting dislike and negative interaction patterns. Rosenholtz (1980) found some support for Cohen's position by observing that students with high reading ability tend to dominate interaction with lower achieving classmates.

There is some reason to believe that most theorizing and research on unequal power relationships have focused on competitive situations. Emerson (1962) and Weber (1947) both explicitly limited their discussions of power to competitive situations. Other important definitions implicitly place power with a competitive context. Dahl (1957) proposed that power is the capacity to get others to do what they would not otherwise do, and other definitions have emphasized that power involves the control of others and the avoidance of being controlled (e.g., Mayhew, Gray, and Richardson, 1968; Russell, 1938). Many popular books stress the competitive use of power to "win" the "power game" (e.g., Korda, 1975).

The positive view of unequal power relationships is presented by Johnson and Johnson (1982). They state that power differences pervade all human relationships and that the exertion of power is constantly changing as individuals modify and adjust their behavior to stay coordinated with one another. The basis for influence among individuals is their mutual dependence as they strive to achieve joint or compatible goals. Individuals determine their needs and goals, assess their resources, determine what coalitions are needed to achieve their goals, and contract an exchange of resources that is mutually beneficial to all parties. Relative power is seen as constantly changing, being multidimensional, and as enhancing collaboration. There is considerable research on cooperation that indicates that collaborators are open to being influenced by one another, use their power to facilitate each other's goal accomplishment, accurately perceive each other's needs, view the relationship as being characterized by trust and mutual helpfulness, and like each other (Johnson, 1980; Johnson & Johnson, 1975, 1978).

While these two views of unequal power relationships are often contrasted against each other, it is quite possible that both are valid under different situational conditions. It is hypothesized, therefore, that the negative view of unequal power relationships will be confirmed under competitive conditions and the positive view of unequal power relationships will be confirmed under cooperative conditions.

Method

Sample

Sixty-four undergraduate students attending Simon Fraser University participated in the study. They were randomly assigned to four conditions, 16 in each condition, stratifying for sex so that there were an equal number of males and females in each condition. Subjects received course credit for their participation and one chance to win $15 in a lottery.

Independent Variable

The independent variables were: high or low power and cooperative or competitive context. All subjects were instructed to take the role of a manager in one of two companies. High power was operationalized with the participants in the role of the manager of the more powerful company, Bolt

Metals; subjects in the low power condition assumed the role of the manager of the less powerful company, Ferrous Metals. Bolt was more powerful because it could affect the goal of Ferrous to a greater extent than Ferrous could affect the goals of Bolt, earn substantially more profits than Ferrous, and give its manager more chances to win $15 in the lottery. (Chances in the lottery were included as tangible, personal incentives for the subjects.) In addition, Bolt would increase profits and chances only marginally if it received all necessary resources from Ferrous, whereas Ferrous would increase its profits and chances to a considerable degree if it received all the resources it could use from Bolt. Specifically, Bolt controlled a mineral and an energy in excess of what it needed for its own production and if the mineral and energy were given to Ferrous it would increase Ferrous' profits and its manager's chances for $15 considerably. Ferrous had power over Bolt in that it had an extra mineral and energy that if given would increase Bolt's profits and its manager's chances for $15. Ferrous' power over Bolt, however, was less than Bolt's power over Ferrous because the resources Ferrous controlled would increase Bolt's profits and manager's chances only very moderately. On this basis, it was expected that subjects would believe that the Bolt manager was more powerful than was the Ferrous manager.

The cooperative or competitive context was operationalized by the relationship between the profits of the two companies and chances to win the lottery. In the cooperative context, Bolt and Ferrous produced different metals and, because they were part of a larger corporation, the profits from each company were positively linked. The more profits one company made then the more profits and chances the other company received. In the competitive context, Bolt and Ferrous produced the same kind of specialized metals and the more profits one company made the less the profit and the fewer the chances in the lottery the other company received.

Dependent Variables

The first dependent variable was the type of influence strategy the subjects chose to use during the experimental session. Three types of messages were available: inducibility, in which the subject agreed to do whatever the other manager wanted; coercive, in which the subject threatened to withhold resources from the other if the other did not comply with what the subject wanted, and negotiation, in which the subject asked the other to consider the subject's suggestion but expressed a willingness to be influenced by the other.

The second dependent variable was the resources given to the other manager. At the end of the negotiations, the subjects completed a form that stipulated the amount and type of resources (if any) they would give to the other. The percentage of the resources the other needed that each subject gave was computed. For example, subjects who gave 80 percent of the resources the other needed were given a score of .80. This procedure avoided the complications involving the comparison of different types and amounts of resources.

The third dependent variable was perspective-taking. Subjects were asked to specify the excess resources the other company originally had in the post-experimental questionnaire. Their responses were scored from exactly accurate (10) to extremely inaccurate (0). The more accurate their understanding of the other company's resource situation, the greater their ability to take the other company's perspective.

Attitudes and orientations were measured by single item questionnaire responses. One set of dependent measures involved the attitudes of participants toward the other and the relationship. In the post-experimental questionnaire subjects rated on 7-point scales the extent to which they perceived the relationship to be cooperative, their helpfulness to the other, the other's helpfulness to them, how generous they felt toward the other, how much they trusted the other, how informed they felt by the other, and how interested they were to meet the other socially.

Another set of dependent variables involved the orientation of the subjects toward influence and power. On the prenegotiation questionnaire subjects rated on 7-point scales the extent they felt able to influence the other, they expected to be responsive to the other's requests, they expected the other to help them, and they expected to attempt to control the other manager. On the post-experimental questionnaire subjects rated the extent they were open to influence from the other, they tried to control the other, the other tried to control them, they encouraged mutual influence, and the power they had in relation to the other manager.

Procedure

Subjects were told that the experiment studied communication between persons who can exchange resources with each other. The experiment was conducted in three phases: the subjects prepared for the negotiations with a manager from the other company, the subjects negotiated with the other manager, and the subjects were debriefed.

Four participants with two confederates (posing as participants) were scheduled for each session. To begin phase 1, two groups, each with two participants and one confederate, were led into separate rooms and read instructions that informed them of experimental session and situation. The participants in the cooperative condition read the following instructions:

The situation: You and another person will take the roles of managers of two companies, Bolt Metals and Ferrous Metals, which are both part of the larger corporation, Metalworks. Bolt and Ferrous produce different types of specialized metals. Bolt produces a metal used in making building equipment; Ferrous produces a metal used in construction, especially of skyscrapers. Since these two companies are part of a larger corporation, the profits each company received depends on how well it does and how well the company does. The more profits one company makes, the more profits the other company receives. Since the number of chances you earn to win $15 depends on how many profits your company makes, the more profits your company earns and the more profits the other company earns, the more chances to win $15 you will receive. The Profit Sheet contains the details of your company's profits and your chances for participating in this study.

Your goal as manager is to increase your company's earnings and the number of chances for $15 you earn for yourself. Since Ferrous and Bolt are part of a larger corporation, your company's profits and your chances depend upon both companies operating efficiently and profitably. As indicated in the profit sheet, the more profits each company earns, the more profits and chances the other company receives. There will be two lotteries conducted after the experiment is completed. Participants who are the manager of Ferrous will be in one lottery and those who are the manager of Bolt will be in the other. The more chances that the other person received does then not make it less likely that you will win the $15. The more chances you earn, the more likely you will be to receive the $15.

To produce the metals, each company needs minerals A and B and energy sources C and D. (The energy supplied cannot be used interchangeably because each form of energy is needed in the production of the metals.) A meeting has been called to discuss the possibility of exchanging resources.

The participants in the competitive condition read the following instructions:

The situation: You and another person will take the roles of managers of two competing companies, Bolt Metals and Ferrous Metals. Both companies produce specialized metals that are used in making building equipment and construction, especially the construction of skyscrapers. Since the companies produce the same type of product, they compete with each other for customers and sales. The profits for each company reflect these opposing interests: The more profits one company earns, the fewer profits for the other company. In addition, the number of chances you earn to win $15 depends upon the amount of profits your company makes; the more profits for the company, the more chances to win $15. The chances will be divided between you and the other person according to the relative profits of each company. The more profits and chances you receive, the fewer profits and chances the other person will receive. The Profit Sheet contains the details for your company's profits and your chances.

contains the details for your company's profits and your chances.

Your goal as manager is to increase your company's earnings and the number of chances for $15 you earn for yourself. Since Ferrous and Bolt compete in the same market, your company's profits depend upon how profitable the other company is. As indicated in the profit sheet, the more profits one company earns, the fewer profits and chances the other company receives. In addition, since one lottery will be conducted after the experiment, the more chances the other person earns, the less likely it will be that you will win the $15 in the lottery.

To produce the metal, each company needs minerals A and B and energy sources C and D. (The energy supplies cannot be used interchangeable because each form of energy is needed in the production of the metal.) A meeting has been called to discuss the possibility of exchanging resources.

Participants in the high power condition took the role of the manager of Bolt and those in the low power took the role of the manager of Ferrous. Participants in both conditions read the following instructions:

Bolt is a stronger, more resourceful company than Ferrous. It has more minerals and energies and is able to produce more valuable metal. Without any exchange of energy or minerals, Bolt will earn substantially more profits in the next year than Ferrous and its manager more chances to win $15 than the manager of Ferrous. In addition, Bolt will increase its profits and chances only somewhat if it receives all the resources it can use from Ferrous, whereas Ferrous will increase its profits and chances considerably if it receives all the resources it can use from Bolt.

Participants received one of four profit sheets depending upon their condition. For participants in the high power condition, they read that Bolt had an excess supply of Mineral B and Energy D, but could use more Mineral A and Energy C to increase the company's profits and its manager's chances to win the lottery. Participants in the low power condition read that Ferrous had an excess supply of Mineral A and Energy C, but could use more Mineral B and Energy D to increase its profits and chances. They also read that these resources could be transferred to the other without affecting their own profits. The situation was structured, though the participants were originally unaware of this, so that Ferrous and Bolt could give all the resources the other needed and still have enough resources for their own operation. Consistent with the instructions, the profit sheets indicated that Bolt's profits and chances would increase only slightly with more Mineral A and Energy C, whereas Ferrous' profits and chances would increase considerably with more Mineral B and Energy D. Also consistent with the instructions, participants in the competitive condition were shown that as the other's profits and chances increased, their own decreased. Participants in the cooperative condition read that as their profits and chances increased the other's profits and chances would also increase. The participants were informed that they could not show this sheet to the manager from the other company, but, if they wished, could share the information with the other manager.

After the participants seemed to understand the experimental situation and believed they were in cooperation or competition with high or low power, they completed the prenegotiation questionnaire. To begin the second phase, one participant from each group was paired with a participant from the other group. They were then told to make an opening statement and then to negotiate for fifteen minutes. After that time, they completed a report form indicating the types and amounts of resources they would give to the other. They were then separated and asked to complete the post-negotiation questionnaire. They were then probed for suspicion, debriefed, thanked, given course credit, and one chance to win $15 in the lottery.

Confederates

Eight undergraduates were trained to be confederates. In order to help standardize the procedures, all eight were females. They were given 12 hours of training and participated in an extensive pilot study to learn to brief the participants about the situation and to become personally involved in it. They were trained to present themselves as participants and to help the participants understand the phases and activities of the experiment by discussing the instructions with them. They also read with the participants the sections of the instructions that pertain to the conditions. They helped the participants in the high power condition understand that they could affect the goals of the person from the other group to a greater extent than the other could affect theirs and the participants in the low power condition understand that they could not affect the other's goals to as great an extent as the other could affect theirs. Moreover, they insured that participants in the cooperative condition understood that their goals were positively linked with the goals of the person from the other group and that participants in the competitive condition understood that their goals were negatively linked. Each confederate was used in all four conditions. To reduce the possibility of demand effects, the confederates and experimenter were unaware of the experimental hypothesis. Confederates did not see the dependent measures nor interacted with the participants in phase 2 when they completed most of the dependent measures.

Analyses

A 2x2 ANOVA was used to analyze the data. An initial analysis was conducted between male and female subjects and, since no significant differences were found, the final analysis did not include sex as an independent variable.

Results

Subjects were placed in a cooperative or a competitive context and assigned to a high or low power position. From Table 2 it may be seen that subjects in the cooperative conditions perceived the context to be more cooperative than did the subjects in the competitive conditions, $F(1,60) = 8.00$, $p < .01$, and subjects in the low power positions perceived the other as having more relative power than did the subjects in the high power positions, $F(1,60) = 36.55$, $p < .001$. These results indicate the conditions were successfully implemented.

The major dependent variable was the influence strategy used by subjects. From Table 1 it may be seen that low power subjects in the competitive situation proposed negotiations most frequently, followed by indicating their willingness to be influenced by the other. The high power subjects in the competitive situation used coercion the most frequently, followed by inducibility. The low and high power subjects in the cooperative relationship used very similar influence strategies, with inducibility dominating and negotiations second. Only 2 of the 32 subjects in the cooperative conditions used coercion as their influence strategy.

Insert Tables 1 and 2 About Here

From Table 2 it may be seen that previous to the negotiations subjects in the cooperative conditions, compared with subjects in the competitive conditions, expected more help from the other, $F(1,60) = 2.67$, $p < .10$, expected to be more responsive to the other's needs, $F(1,60) = 9.90$, $p < .001$, expected to engage in fewer attempts to influence the other, $F(1,60) = 7.49$, $p < .01$, and felt less influential, $F(1,60) = 3.75$, $p < .10$. Subjects in the high power position expected less help from the other, $F(1,60) = 4.57$, $p < .05$, and expected to be less responsive to the other's needs, $F(1,60) = 3.62$, $p < .10$, than did the subjects in the low power position.

The data in Table 2 indicate that during negotiations the subjects in the cooperative conditions gave the other manager more resources, $F(1,60) = 6.93$, $p < .01$, and were more accurate in taking the other's perspective, $F(1,60) = 3.44$, $p < .10$, than were the subjects in the competitive conditions. Subjects in the cooperative conditions liked, $F(1,60) = 8.53$, $p < .01$, and trusted, $F(1,60) = 4.27$, $p < .05$) the other manager more than did the subjects in the competitive conditions.

The subjects in the cooperative conditions perceived the relationship between the high and low power managers as being characterized by more own helpfulness, $F(1,60) = 20.35$, $p < .001$, other's helpfulness, $F(1,60) = 7.87$, $p < .01$, own generosity, $F(1,60) = 8.35$, $p < .01$, and other's openness, $F(1,60) = 11.90$, $p < .001$, than did the subjects in the competitive conditions.

Finally, the subjects in the cooperative, compared with the competitive, conditions perceived themselves to be more open to the other's influence, $F(1,60) = 2.81$, $p < .10$, less controlling, $F(1,60) = 14.25$, $p < .001$, perceived the other as being less controlling, $F(1,60) = 7.57$, $p < .01$, and perceived oneself as encouraging more mutual influence, $F(1,60) = 4.99$, $p < .05$.

Discussion

A great deal has been written about the corrupting aspects of high power and the need to control others to "win" the "power game" (Hinings, Hickson, Pennings, & Schneck, 1974; Korda, 1975). But is power always negative? McCelland (1970) found that some individuals express their needs for high power by joining organizations and groups to promote altruistic goals that benefit society. Theorists focusing on cooperation have proposed that the exercise of power pervades all relationships and often facilitates the achievement of mutual benefits (Johnson & Johnson, 1982). The results of this study indicate that unequal power relationships can be destructive or constructive for individuals depending on whether they are interacting in a competitive or a cooperative context.

There has been disagreement as to how unequal power will affect the influence strategies used by high and low power individuals. Within competitive situations there is evidence that high power individuals use coercion while low power individuals use submissiveness as their major influence strategies (Rubin & Brown, 1975). The results of this study indicate that within the competitive condition the high power subjects used coercion most frequently while the low power individuals most fretquently suggested negotiation. Deutsch (1949, 1962) has posited that within cooperative situations there will be a high level of inducibility where participants are willing to be influenced by their collaborators. Despite the considerable amount of research on cooperation and competition (Johnson, 1980; Johnson & Johnson, 1975, 1978), there have been few if any direct tests of Deutsch's inducibility proposi[illegible] until this study. The results of this study support Deutsch's th[illegible]g, as both high and low power subjects in the cooperative conditions indicated that they would accept the other's suggestions for an exchange of resources. In addition, there was almost a total absence of the use of coercion within the cooperative conditions. In addition to the theoretical importance of these findings, there are important practical implications. Within organizations, where unequal power relationships are the rule, high and low power individuals who clearly recognize their cooperative interdependence may be far more likely to be highly receptive to each other's influence than to attempt to coerce each other to do what they want.

Competition has not only been found to promote influence strategies such as coercion and threat, but also a refusal to facilitate the achievement of each other's goals and often an outright attempt to obstruct each other's goal achievement (Deutsch, 1962, 1973). Within this study not only did competition promote the use of coercion by the high power subjects, but both the high and low power subjects then withheld the resources needed by the other, giving only between 40 and 50 percent of the resources the other needed. The high and low power subjects in the cooperative condition, by comparison, provided each other with over 75 percent of needed resources.

These results confirm Deutsch's theorizing that cooperation promotes the facilitation of each other's goal achievement while competition promotes the obstruction of the goal achievement of the other. The coercion attempted by the high power subjects in the competitive conditions seem to result in resistance by the low power person and a lack of generosity by the high power person. In this study, competition and coercion did not pay.

Subjects' perceptions of the exercise of power were congruent with their actual behavior in this study. Subjects in the competitive, compared with those in the cooperative, conditions perceived themselves as resisting the other's influence, trying to control the other, and discouraging mutual influence. Prior to negotiations subjects in the competitive conditions expected little help from the other, expected to not be responsive to the other's needs, expected to try to control the other, and at the same time felt more powerful than did the subjects in the cooperative conditions. The relationship between the high and low power individuals in the competitive conditions was perceived as being characterized by less mutual willingness to help the other obtain needed resources, greater selfishness, and more closed communication. Competition seemed to promote a belief that both oneself and the other will act in egocentric ways without concern for each other and the false confidence that one has the power to control the other. Such expectations and beliefs have little place in most organizations, as organizational effectiveness largely depends on the willingness of members to support, assist, and facilitate each other's goal achievement.

In the previous research it has commonly been found that cooperation promotes greater trust than does competition (Deutsch, 1962, 1973). There has been almost no research, however, on whether the trust would survive the strain of unequal power among collaborators. The results of this study corroborate the previous findings that cooperation promotes higher trust than does competition, and extends the previous research to include the unequal power situation. Trust and inducibility are intertwined, as inducibility rests on the belief that the other can be trusted to act in mutually beneficial ways and not exploit one's willingness to be influenced.

One of the most important competencies for interacting effectively with others is perspective-taking, i.e., the accurate understanding of how others perceive their needs and goals. The opposite of perspective-taking is egocentrism, where individuals are so embedded in their own frame of reference that they are unaware of other points of view and of the limitations of their own perspective. Perspective-taking ability is highly related to communication effectiveness and the constructive management of conflicts (Johnson, 1971, 1980). The results of this study indicate that when high and low power individuals interact, perspective-taking will be more accurate within a cooperative than a competitive context. These findings corroborate previous research demonstrating a relationship between perspective-taking accuracy and cooperation (Johnson, 1975a, 1975b; Johnson, Johnson, Johnson, & Anderson, 1976).

Finally, there is considerable evidence that cooperation promotes greater interpersonal attraction than does competition (Johnson & Johnson, 1975, 1978). The results of this study provide an important extention of that work by demonstrating that the previous findings for equal power relationships are also valid for unequal power relationships. These findings, furthermore, have important practical implications. There has been considerable controversy over whether positive or negative relationships will develop between majority and minority members when organizations such as businesses and schools are integrated. Minority members are often perceived to have less power in such organizational settings (e.g., Cohen, 1975, 1980). The results of this study indicate that individuals of unequal power may form positive relationships with each other if they are interacting within a cooperative context.

It is of interest that power by itself seemed to have little impact on subject's behavior and attitudes. Subjects in the high power position prior to negotiations expected to receive less help from the other and expected to be less responsive to the other's needs than did the low power individuals. Despite creating somewhat different expectations for interaction and promoting the use of different influence strategies in the competitive conditions, differences in power had very little impact on the dependent variables in this study. The results of the condition check, furthermore, indicate that awareness of the power differences was quite high, indicating it was not failure to vary power sufficiently that caused the lack of results.

In summary, the results of this study indicate that when unequal power relationships take place within a competitive (compared with a cooperative) context, they will be characterized by the high power person's use of coercion, the withholding of resources needed by the other, the belief that parties will act in egocentric ways without concern for the other, belief that one can control the other, distrust of the other, inaccurate understanding of the other's perception of needs and goals, and dislike for the other. Unequal power relationships within a cooperative context, on the other hand, are characterized by high inducibility; exchange of needed resources; views of influence as being mutual and based on responsiveness to each other's needs; a positive view of the relationship as being characterized by mutual helpfulness, generosity, and openness; high trust in one another; accurate perspective-taking; and high interpersonal attraction. These results indicate that both the negative and positive views of unequal power relationships are valid, depending on the situational context in which they occur. Organizations that ensure a cooperative context is clearly perceived by members with unequal power, can do much to help them work together effectively.

References

Appelbaum, E. On conflicts and bargaining. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 7, New York: Academic Press, 1974.

Cohen, E. The effects of desegregation on race relations. Law and Contemporary Problems, 1975, 39, 271-299.

Cohen, E. Design and redesign of the desegregated school: Problem of status, power, and conflict. In W. Stephen and J. Fengin (Eds.), Desegregation: Past, present, and future. New York: Pelenum Press, 1980.

Dahl, R. P. The concept of power. Behavior Science, 1957, 2, 201-218.

Deutsch, M. An experimental study of the effects of cooperation and competition upon group process. Human Relations, 1949, 2, 199-231.

Deutsch, M. Cooperation and trust: Some theoretical notes. Nebraska Symposium on Motivation, 1962. Lincoln, NE: University of Nebraska Press, Vol. 10.

Emerson, R. M. Power-dependence relations. American Sociological Review, 1962, 27, 31-41.

Hinings, C. R., Hickson, D. J., Pennings, J. M., & Schneck, R. E. Structural conditions of intraorganizational power. Administrative Science Quarterly, 1974, 19, 22-44.

Johnson, D. W. Role-reversal: A summary and review of the research. International Journal of Group Tensions, 1971, 1, 318-334.

Johnson, D. W. Cooperativeness and social perspective-taking. Journal of Personality and Social Psychology, 1975, 31, 241-244 (a).

Johnson, D. W. Affective perspective-taking and cooperative predisposition. Developmental psychology, 1975, 11, 869-870 (b).

Johnson, D. W. Group processes: Influences on student-student interaction on school outcomes. In J. McMillan (Ed.), The social psychology of school learning. New York: Academic Press, 1980.

Johnson, D. W., & Johnson, F. Joining together: Group theory and group skills (2nd Ed.). Englewood Cliffs, NJ: Prentice-Hall, 1982.

Johnson, D. W., & Johnson, R. Learning together and alone: Cooperation, competition, and individualism. Englewood Cliffs, NJ: Prentice-Hall, 1975.

Johnson, D. W., & Johnson, R. Cooperation, competition, and individualistic learning. Journal of Research and Development in Education, 1978, 12, 3-15.

Johnson, D. W., Johnson, R., Johnson, J., & Anderson, D. The effects of cooperative versus individualistic instructions on student pro-social behavior, attitudes toward learning, and achievement. Journal of Educational Psychology, 1976, 68, 446-452.

Jones, E. E. Ingratiation. New York: Appleton-Century-Crofts, 1964.

Kipnis, D. Does power corrupt? Journal of Personality and Social Psychology, 1972, 24, 33-41.

Kipnis, D. The powerholders. Chicago: University of Chicago Press, 1975.

Korda, M. Power! New York: Random House, 1975.

Mayhew, B. H., Gray, L. N., & Richardson, J. T. Behavioral measurement of operating power structures: Characterization of asymmetrical interaction. *Sociometry*, 1969, *32*, 474-489.

McLelland, D. C. The two faces of power. *Journal of International Affairs*, 1970, *24*, 29-47.

Pfeffer, J., & Salancik, G. R. Organizational decision making as a social process: The case of a university budget. *Administrative Science* Quarterly, 1974, *44*, 135-151.

Rosenholtz, S. Treating problems of academic status. In J. Berger & M. Zelditch (Eds.), *Status attributions and justice*. New York: Elsvier, 1980.

Rubin, J. Z., & Brown, B. R. *The social psychology of bargaining and negotiation*. New York: Academic Press, 1975.

Russell, B. *Power: A new social analysis*. London: Allen & Unwin, 1938.

Solomon, L. The influence of some types of power relationships and game strategies upon the development of interpersonal trust. *Journal of Abnormal & Social Psychology*, 1960, *61*, 223-230.

Thibaut, J. W., & Reicken, H. W. Some determinents and consequences of the perception of causality. *Journal of Personality*, 1955, *24*, 113-133.

Tjosvold, D., & Fabrey, L. I. Motivation for perspective taking: Effects of interdependence and dependence on interest in learning others' intentions. *Psychological Reports*, 1980, *46*, 755-765.

Weber, M. *The theory of social and economic organization*. New York: Oxford University Press, 1947.

Footnote

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Table 1

Distribution of Influence Strategies

	Low Power		High Power	
	Competition	Cooperation	Competition	Cooperation
Inducibility	6	12	5	10
Coercion	1	1	10	1
Negotiation	9	3	1	5

Table 2

Comparison of Means Among Dependent Variables

	Low Power		High Power		
Dependent Variables	Competition	Cooperation	Competition	Cooperation	F
Cooperativeness	4.13	5.73	4.56	5.65	CC: 8.00***
Other's Relative Power	5.38	4.47	2.69	3.35	P: 36.55****
Expect Other's Help	4.44	5.27	3.94	4.88	CC: 2.67* P: 4.57**
Expect to Be Responsive	4.44	5.27	3.63	4.82	CC: 9.90*** P: 3.62*
Expect to Try to Control Other	5.38	4.33	5.44	4.53	CC: 7.49***
Feeling Helpless - Influential	5.13	4.73	5.06	4.50	CC: 3.75*
Resources Given	4.38	7.73	5.13	7.59	CC: 6.93***
Perspective-Taking	6.63	7.33	4.69	7.00	CC: 3.44*
Liking: Meet Socially	4.13	5.53	4.63	4.71	CC: 8.53***
Trust of Other	4.06	5.47	4.25	4.71	CC: 4.27**
Own Helpfulness	3.75	5.98	3.31	5.00	CC: 20.35****
Other's Helpfulness	4.25	5.33	3.69	5.18	CC: 7.87***
Own Generosity	3.75	4.87	3.69	4.76	CC: 8.35***
Informed by Other	3.81	5.47	3.88	5.12	CC: 11.90****
Openness to Other's Influence	3.81	5.00	4.44	4.82	CC: 2.81*
Try to Control Other	5.19	3.73	5.31	3.59	CC: 14.25****
Other Tries to Control You	5.25	3.07	3.75	3.41	CC: 7.57***
Encouraged Mutual Influence	5.00	5.40	3.94	5.29	CC: 4.99**

*$p < .10$; **$p < .05$; ***$p < .01$; ****$p < .001$

NOTE: The higher the mean the more positive the attitude.

CC = Cooperative/Competitive; P = Power